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DISEASES CAUSED BY BACTERIA AND FUNGI.

OHLÉN, R. (1934). Experimentell diplokockjuverinflammation hos ko. [**Experimental Diplococcal Mastitis in a Cow**].—*Skand. VetTidskr.* **24.** 116-130. 15 figs., 2 tables. [English summary : abst. from orig.]

The author injected 5 c.c. of an 18-hour broth culture of diplococci into the milk cistern of a cow through the teat canal, a different quarter of the udder being infected at intervals of a week.

The quarters became swollen and painful about five hours after the injection ; this was followed by a slight rise in temperature which soon returned to normal. A serum-like discharge, containing flocculi, was obtained from the infected quarter ; later, this became purulent. The sediment obtained after centrifugation of this discharge contained polymorphonuclear leucocytes, fibrin and bacteria. The appetite remained good throughout the experiment.

The cow was slaughtered 24 hours after infection of the last quarter, and sections were cut of the udder and lymphatic glands. The alveoli were found to be smaller than normal and they contained leucocytes and shed epithelial cells. The interalveolar tissues showed enlargement and were infiltrated by plasma cells and, occasionally, by round cells. The infiltration was seen to be more acute at the ventral part of the udder than at the dorsal part.—A. A. FORSYTH.

STECK, W. (1934). Die Diagnose des gelben Galtes. [**Diagnosis of Mastitis**].—*Schweiz. Arch. Tierheilk.* **76.** 393-418. 1 fig., 1 table. [34 refs.]

Steck discusses various methods of diagnosis, viz., history, clinical examination, tests for chemical alteration of the secretion, microscopic examination and finally the various cultural methods and methods of identifying mastitis streptococci. He finds that microscopic examination of secretion detects streptococci present in numbers over 2,000 per c.c., whilst surface cultivation of centrifuge deposit on agar will detect mastitis streptococci present in numbers above 10 per c.c.

For herd examinations, therefore, cultural methods are essential whilst the so-called chemical methods are of value as auxiliary tests. The cultural method used by the author is the sowing of 0·5 c.c. of whole milk in tubes containing serum-dextrose agar to a depth of about 12 cm., no further dilutions being necessary if mixing is incomplete. Most colonies visible after 14 to 16 hours' incubation are streptococci. They are further identified by direct transfer to solid media containing fermentable substances.—A. W. STABLEFORTH.

DENNIS, E. W., & BERBERIAN, D. (1934). **A Study on the Mechanism of Invasiveness of Streptococci.**—*J. exp. Med.* **60.** 581-598. 7 figs. on 2 plates, 5 tables. [14 refs.]

The authors have confirmed MENKIN's observations [(1931). *J. exp. Med.* **53.** 171, 179 and 647, and this *Bull.* **4.** 441.] of the failure of inflammatory fixation (such as occurs in the case of staphylococci, for example) in areas of acute inflammation due to haemolytic streptococci. They have shown that this lack of fixation of the invading streptococci goes hand in hand with, and may be attributed to, the production by the streptococci of antifibrinogenic and fibrinolytic substances which prevent the formation of a fibrin barrier or dissolve it, thus maintaining the potency of lymphatics and capillaries and allowing the further dissemination of the organisms.

Both substances are relatively thermostable. Fibrinolysin is destroyed and the antifibrinogenic substance weakened by heating at 100°C. for one hour. Both substances are antigenic and show some degree of specificity. The authors conclude by discussing the role of these substances in invasion of the tissues by streptococci [see also TILLETT & GARNER. (1933). *J. exp. Med.* **58.** 485].

—A. W. STABLEFORTH.

I. GILLAIN. (1933). Rapport sur le vaccin antibactéridien du laboratoire vétérinaire de Kisenyi. [**Report on the Anti-Anthrax Vaccine of the Veterinary Laboratory at Kisenyi**].—*Bull. agric. Congo belge.* **24.** 267-276. 11 tables.

II. WEIDLICH, N. (1934). Ueber den Milzbrand in Karpathenrussland. [*Bacillus anthracis* **Infection in Carpathia**].—*Dtsch. tierärztl. Wschr.* **42.** 338-341. [7 refs.]

III. MANLEY, F. H. (1934). **Observations on Active Immunisation against Anthrax.**—*Vet. J.* **90.** 245-262. [7 refs.]

IV. WEIDLICH, N. (1934). Ein Fall von chronischer milzbrandiger Euterentzündung bei einer Kuh. [**A Case of Chronic Inflammation of the Udder caused by Anthrax**].—*Z. InfektKr. Haustiere.* **45.** 300-326. [39 refs.]

I. The addition of " sunosol " to a sporulating culture of *B. anthracis* in a concentration of 1 : 1,000 was found to be a satisfactory method of preparing a vaccine : " chinosol " (1 : 3,000) could also be used.

II. The author draws attention to the neglect of precautionary measures for preventing the dissemination of anthrax in Carpathia. Comparing the immunological value of Pasteur's vaccine with that of glucoside vaccine, he found that the latter gave better results.

III. Spore vaccine prepared from attenuated strains of *B. anthracis* was successfully used by the author for the immunization of sheep and goats against anthrax. A detailed account is given of the preparation of three batches of vaccine and of the methods employed for testing their safety and potency. The initial tests were carried out with standard doses on guinea pigs and rabbits and, after determining roughly the strength of the spore emulsion, accurate immunity tests were carried out on sheep. In this way a vaccine conferring a high degree of resistance was obtained ; this gave good results in the field. Such a vaccine was not quite so satisfactory for the immunization of goats ; this is attributed to the relatively great susceptibility of some goats.

A limited trial of " carbozoo " vaccine showed that it was of great value, but the injection of attenuated culture together with varying concentrations of saponin produced a severe local reaction.

IV. A cow diagnosed to be suffering from anthrax was treated with hyper-

immune serum and made a successful recovery. Later, *B. anthracis* was recognized in three quarters of the udder, where it apparently caused an acute mastitis. The organisms persisted in the milk for five months in spite of attempts to destroy them by injections of antiserum and of antiseptics into the udder. At the end of this time, *post-mortem* examination of the udder showed that a condition of catarrhal mastitis was present, and *B. anthracis* was found in the alveoli of the affected quarters. The author was able to show that the organisms had become avirulent for the rabbit and concludes that it is possible for an organism to live in the udder although the rest of the organs may be in a state of immunity.—S. J. EDWARDS.

TAHSIN, S., & RICHTER, H. (1934). Ueber die Bekämpfung des Milzbrandes in der Turkei. [**Control of Anthrax in Turkey**].—*Tierärztl. Rdsch.* **40.** 779-782. 2 tables.

In Turkey, the T.U.A. anthrax vaccine [Turk. Universell-Anthrax-Impstoff] has been adopted for routine inoculations as it has proved superior to the methods of Sobernheim and Pasteur. The vaccine is not dangerous ; it is easy to inject and is cheap ; immunity appears soon after vaccination and is strong and of long duration. This vaccine is also a more successful prophylactic against the great variety of strains of anthrax encountered in Turkey.—E. J. PULLINGER.

BOQUET, A., NINNI, C., & BRETEY, J. (1934). Sur la résistance des Cobayes tuberculeux à l'infection charbonneuse. [**Resistance of Tuberculous Guinea Pigs to Anthrax Infection**].—*C. R. Soc. Biol. Paris.* **117.** 311-314. [1 ref.]

Anthrax bacilli, inoculated intradermally into guinea pigs at the site of an inflammatory reaction produced by the inoculation of tuberculin, were rapidly destroyed. No general immunity resulted.—E. J. PULLINGER.

WEILAND, P. G., & LAUTERWEIN, K. (1934). Ueber das Schicksal intraperitoneal einverleibter Tuberkelbazillen bei tuberkuloseimmunisierten und normalen Meerschweinchen. (Ein Beitrag zur Frage bakteriolytischer Antikörper). [**The Fate of Tubercle Bacilli Injected Intraperitoneally into Immune and Normal Guinea Pigs**].—*Zlb. Bakt. I. (Orig.).* **132.** 304-313. 6 figs. [22 refs.]

Immune guinea pigs (those previously inoculated subcutaneously with 0·0001 mg. bacilli), guinea pigs which had extensive lesions in glands and organs, and controls were employed. Four to eight weeks after the immunizing injections, all animals were inoculated intraperitoneally with 50 c.c. of a 1 per cent. aqueous solution of peptone and 20 c.c. of a bacillary suspension which contained 10 mg. virulent bacilli. The peptone water was given 24 hours before the bacillary suspension to ensure that an adequate supply of fluid could be obtained for examination. Cultures of the tubercle bacillus of human origin were used throughout the experiment. After the injection of bacilli, samples of peritoneal fluid were examined at the following intervals :– 15 min., 30 min., 1, 2, 3 hours and 1, 2, 3, 5 and 10 days. It was found that the cell content of the exudate was at its greatest 24 to 48 hours after the bacillary injection, and there was little difference in the numbers of cells in the treated and control animals. Polymorphonuclear leucocytes were most numerous during the first day or so, but after five days lymphocytes were most numerous. The number of free-lying bacilli decreased rapidly and reached a minimum about one hour after injection. Phagocytosed bacteria were most numerous a short time after giving the injection. At the ten-day period, bacilli were found to be few in number in the omentum and spleen in the case of the treated guinea pigs, but were numerous in the case of the control animals.

The phagocytosed bacteria became like fragments or granules and, with their phagocytes (the polymorphonuclear cells), were further destroyed by large mononuclear cells. The cellular reaction against the bacteria was more intense and occurred earlier in the treated than in the control animals.—D. R. WILSON.

I. DUBOIS, C. (1934). Possibilité du diagnostic simultané de la tuberculose et de l'avortement épizootique des Bovidés par la recherche des réactions d'allergie. **[Simultaneous Diagnosis of Tuberculosis and Contagious Abortion of Cattle by Allergic Reactions].**—*C. R. Soc. Biol. Paris.* **115.** 1065-1068. [1 ref.]

II. COVENEY, M. F., & EDINGTON, J. W. (1934). **The Biological Test for the Presence of *M. tuberculosis* in Milk.**—*Vet. Rec.* **14.** 447-450. [9 refs.]

III. MATTICK, A. T. R., & CHRISTIAN, M. I. (1934). **The Vernes Test for the Diagnosis of Tuberculosis in Dairy Cattle. An Investigation on its Applicability.**—*J. Hyg., Camb.* **34.** 157-165. 1 fig., 8 tables. [5 refs.]

I. Of 103 cattle tested simultaneously by the intradermal method with tuberculin and with abortin, 17 reacted to tuberculin alone, 15 to abortin alone and 12 to both tests. Of these latter, lesions of tuberculosis were found in nine, and three reacted to the agglutination test for *Br. abortus.* The writer is of the opinion that when tuberculosis and contagious abortion coexist in an animal they may be diagnosed by the application of the two reagents simultaneously.

II. With a view to expediting the detection of *Mycobact. tuberculosis* in milk by the biological test, the authors investigated the value of applying the intradermal test to the inoculated guinea pigs. Out of a group of 110 guinea pigs, found on *post-mortem* examination to be tuberculous one month after inoculation with infected milk, 86 (78 per cent.) reacted to the test at this time. In a second group of 88 animals similarly infected, 28 (32 per cent.) gave positive reactions in 14 to 16 days. Since, at the time of conducting these experiments, the authors were only able to detect infection with tuberculosis in 8·5 per cent. of all mixed milk samples and only about one-third of these could be diagnosed by the early application of the skin test, they conclude that the result does not justify the labour involved in carrying out the test.

III. The authors applied a flocculation method described by VERNES and his co-workers for the detection of tuberculosis in cattle. Using the standard technique, which consists in measuring the amount of flocculation by the Vernes-Bricq Yvon photometer during four hours' incubation at 20°C., when 0·6 c.c. of resorcin is added to an equal volume of suspected blood serum, they were not able to distinguish the sera of normal animals from those reacting to the tuberculin test, or from those in advanced clinical stages of the disease. By varying the proportion of the reagents and the time of inoculation, they were still unable to find that the test was of value in the diagnosis of bovine tuberculosis.—S. J. EDWARDS.

FELDMAN, W. H. (1934). **Spontaneous Tuberculous Infections in Dogs.**—*J. Amer. vet. med. Ass.* **85.** 653-663. 3 figs., 2 tables. [22 refs.]

Feldman describes a case of spontaneous tuberculosis in a dog which had been kept under laboratory conditions for other work for two and a half years. The infecting organism was of the bovine type. The lesions were confined to the lungs and liver and from their histopathology the author concludes that they were of recent origin. A table is given of previous cases of tuberculosis in dogs in which the causal organism had been typed : of a total of 87 cases, 33 were due to the bovine type and 50 to the human type, whilst in four cases the organisms obtained were atypical.—A. W. STABLEFORTH.

SUCHARD, L. (1934). Essais sur la vitalité et la virulence du bacille tuberculeux désséché. [**The Viability and Virulence of Desiccated Tubercle Bacilli**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 48. [18 refs.]

A bovine strain of *Mycobact. tuberculosis* was suspended in normal saline solution or distilled water. The emulsions were then desiccated in petri dishes at 37°C. The existence of viable organisms was determined from time to time by the inoculation of guinea pigs with 0·1 mg. of the dried bacilli. Positive results were obtained after six months [the end-point in the experiments], but there appeared to be a marked delay in the evolution of the lesions in animals receiving the dried organisms as compared with untreated emulsions. Tubercle bacilli from potato cultures, which had been desiccated at 37°C., were still virulent after ten months.—R. E. GLOVER.

FINZI, G. (1934). Nuovi dati sulla biologia del bacillo tubercolare e sulle " esotubercoline ". [**Biology of** *Mycobact. tuberculosis* **and of Exotuberculin**].—*Critica zootec.* **11.** 198-202. [6 refs.]

FINZI, G. (1934). Nuovi dati sulla biologia del mycobacterium tuberculosis. Le " esotubercoline spente ". [**Biology of** *M. tuberculosis.* **" Extinguished Exotuberculin "**].—*Profilassi.* **7.** 121-124. [8 refs.] [English and French summaries : abst. from orig.]

FINZI, G. (1934). Ueber die Biologie des Mycobacteriums tuberculosis und über " gelöschtes Tuberkulin ". [**Biology of** *M. tuberculosis* **and of " Extinguished Tuberculin "**].—*Wien. tierärztl. Mschr.* **21.** 449-453. [8 refs.]

Previous work has shown that the active principles of the author's exotuberculin are intimately connected with the soluble exotoxins of *M. tuberculosis.* To prepare exotuberculin, human or bovine type cultures are grown in 5 per cent. glycerin broth or in synthetic media at 37·5° to 38·5°C. for four to six weeks. The perfectly clear fluid is then aspirated off, filtered and treated with five parts of formalin per 1,000. It is claimed that, with this tuberculin, the intradermal test in both human beings and bovines gives more clear-cut results than when old tuberculin is used. The activity of exotuberculin is due to both the thermostable and thermolabile elements produced by *M. tuberculosis.* When, however, the bacilli are grown at 41·5° to 42°C., exotuberculin is not produced. In this case, the culture fluid contains other active metabolic products which have antigenic properties, and it is tolerated in large doses by tuberculous guinea pigs and cattle. Since the thermal reaction obtained on treating cases of tuberculosis with old tuberculin can be very severe, this new product (" extinguished exotuberculin ") should prove of great therapeutic value.—J. A. NICHOLSON.

DOWNIE, A. W., & MEISSNER, Gertrud. (1934). Untersuchungen über die Filtrierbarkeit der Tuberkelbazillen. [**Experiments on the Filtrability of the Tubercle Bacillus**].—*Zlb. Bakt. I. (Orig.).* **130.** 465-497. 8 tables. [74 refs.]

It was found that tubercle bacilli occasionally passed through Berkefeld V and Chamberland L_2 filter candles and could be recovered by inoculation of guinea pigs with filtrate. In no case did this organism pass Berkefeld N or Chamberland L_3 filters. The technique of Ninni, who claimed to be able to produce lesions by the inoculation of filtrates of tubercle bacilli into cervical lymphatic glands, was repeated. Using Sauton cultures of a Vallée strain of tubercle bacilli, no obvious tuberculous lesions were produced, though minute acid-fast bodies could be seen in glandular tissue. The technique of Deinse, who injected filtrates of young cultures intraperitoneally and found acid-fast bodies in the mesenteric

lymphatic glands, was also repeated. Very occasionally, the authors produced typical tuberculous lesions, but in the majority of cases no lesions appeared. The authors conclude that they found no evidence of an ultravisible form of *Mycobact. tuberculosis* but that, under certain conditions, normal organisms may pass through bacterial filters.—E. J. PULLINGER.

ARLOING, F. (1934). Recherches sur la bacillémie tuberculeuse d'après la méthode de Loewenstein. [**Results of Application of Löwenstein's Method in Tuberculous Bacillaemia**].—*Bull. Soc. Sci. vét. Lyon.* **37.** 92-96.

An examination, by Löwenstein's method, of 67 blood samples from [human ?] cases of pulmonary tuberculosis, yielded 3·3 per cent. of visible cultures which were all fully virulent. In addition, microcultures were obtained in 20 per cent. of cases in which the strains resembled the ultravirus of the tubercle bacillus, as shown by their very slight pathogenicity for the guinea pig and by the difficulty in obtaining cultures. The possible causes of error in such investigations are discussed [see also WILSON – this *Bull.* **4.** 412].—R. E. GLOVER.

VAN OIJEN, C. F. (1934). La méthode Loewenstein appliquée au sang des bovidés. [**Löwenstein's Blood Culture Method Applied to Cattle**].—*Acta vet. neerl.* **1.** No. 3. pp. 64. 14 figs., 1 plate, 10 tables. [English and German summaries : abst. from orig. in French].

Repeated attempts were made to demonstrate a tuberculous bacillaemia in two rabbits and three calves, all of which had been artificially infected and had developed generalized tuberculosis, and in three cows, all of which had developed generalized tuberculosis as the result of natural infection and one of which had tuberculous mastitis. Blood was obtained on five to 30 occasions, spread over a period of weeks or months, from the ear vein, jugular vein, mammary vein or from the heart at autopsy. It was used immediately, after citration, after haemolysis with 0·5 per cent. acetic acid and centrifuging, or after further treatment with sulphuric acid to destroy contaminants. It was sown on Löwenstein's solid medium (details given) and in a smaller number of cases on other media. Guinea pigs were also occasionally inoculated.

Positive results were obtained with 16 samples of blood from artificially infected animals ten minutes to 27 days after infection and also with seven samples from naturally infected animals.

Tubercle bacilli were cultivated at times from the venous blood leaving the udder of a cow, from the jugular blood in artificially infected animals, from their heart blood and from that of one case of spontaneous tuberculosis and from the " meat juice " of several animals.

The author considers that the method of Löwenstein is as reliable as guinea pig inoculation. Löwenstein's solid medium, without glycerin, gave a somewhat higher percentage of positive results than his liquid medium, or the solid medium of Petragnani ; the number of tests carried out with these two media was, however, small.—A. W. STABLEFORTH.

COWEN, M. E., & HENDERSON, E. J. (1934). **A Successful Method of Cultivating Tubercle Bacilli.**—*Amer. Rev. Tuberc.* **29.** 368-372. [4 refs.]

Using a slight modification of Petragnani's medium, the authors obtained a culture of *Mycobact. tuberculosis* on every tube seeded from 72 specimens of known positive sputa, while colonies appeared in 14·5 per cent. of 185 samples negative on microscopic examination. The value of this media as compared with other methods and with animal inoculations was not determined.—R. E. GLOVER.

PUKALL, R. (1934). Weitere neuartige Nachweismethoden von Rinder-Tuberkelbazillen unter besonderer Berucksichtigung des Einengungsverfahrens. [**New Ways of Demonstrating Tubercle Bacilli**].—*Inaug. Diss. Berlin.* pp. 44. 3 tables. [116 refs.]

A brief summary is given of the methods which have been devised for the demonstration of tubercle bacilli in smears since the time of KOCH and how various investigators have tried to improve on the time-honoured method of Ziehl-Neelsen. In the latter group, the attempts have usually been along the lines of previous treatment of suspected material – for example, sputum – by such reagents as sodium hydroxide or antiformin.

The author uses a modification of methods suggested by previous workers. Sputum was treated either by 2 per cent. glycerin water, glycerin broth or glycerin milk, incubated for 24 to 48 hours, shaken and centrifugalized. Smears of the deposit were stained by Spengler's picric acid carbol fuchsin method. The author states that the bacilli were rendered more easily detectable, as compared with ordinary methods, to the extent of 10 per cent. more positives, and that this was attributable to concentration of the organisms present but not due to a multiplication of the bacilli during the incubation, as contended by other workers.

—J. R. M. INNES.

TENHAEFF, C. (1934). De voorbehoedende enting tegen tuberculose met den B.C.G. [**BCG Vaccination of Cattle in the Control of Tuberculosis**].—*Tijdschr. Diergeneesk.* **61.** 735-749. 2 tables. [6 refs.] [English, French and German summaries : abst. from orig.]

In addition to other investigations of the Veterinary Service of the Dutch Government concerning vaccination with BCG, the author carried out experiments, from 1925 to 1933, on 466 cattle belonging to five heavily infected farms. These animals were exposed to natural infection (placed next to coughing cattle ; calves fed with raw milk).

In ten out of 130 cattle (7·6 per cent.), inoculated with BCG three to seven times, tuberculous lesions were found at autopsy ; one of these only showed a slight tuberculosis of the lymph glands and four had caseous foci in the lungs which had not been observed clinically. Ten repeatedly vaccinated cows, which had been placed for some time next to coughing cows in other infected farms, did not show any symptoms of tuberculosis at autopsy.

These investigations help to prove the immunizing value of BCG vaccine in cattle. The author recommends, however, the combination of BCG vaccination with other methods of control.—J. VAN DER HOEDEN (UTRECHT).

BATANOFF, W. A., & JEROFEJEFF, P. P. (1933). Ueber biologische und pathologisch-anatomische Veränderungen im Meerschweinchenorganismus unter Einwirkung des Stammes B.C.G. [**Biological and Pathological Changes in Guinea Pigs Caused by a Strain of BCG**].—*G. Batt. Immun.* **11.** 117-208. 22 figs. [English, French and Italian summaries : abst. from orig. in German].

The pathogenicity of BCG for guinea pigs has been studied. A general type of infection may result, particularly after massive injections. There is loss of weight, while a differential blood cell count reveals a fall in erythrocytes, leucocytes and lymphocytes and an increase in monocytes. On *post-mortem* examination, organs show hyperplasia of reticulo-endothelial tissue and granuloma formation. Ultimately, granulomata regress and healing is usually complete.

The authors failed to demonstrate dissociation of BCG into smooth and

rough variants according to Petroff's method, and they failed to obtain positive blood cultures on Löwenstein's medium from guinea pigs inoculated with the organism.

Six guinea pigs, immunized with this strain of BCG, satisfactorily survived subsequent doses of virulent tubercle bacilli, which produced generalized tuberculosis in control animals.—E. J. PULLINGER.

BELLI, M. (1934). L'attivita biologica del focolaio locale da BCG nel topolino di fronte allo streptococco di Schütz. **[Biological Activity of a Local Depot of BCG in Mice affected with** *Streptococcus equi***].**—*G. Batt. Immun.* **12.** 81-119. 3 figs. [25 refs.] [Abst. from abst. in *Bull. Inst. Pasteur.* **32.** 920].

The author found that when *Str. equi* was inoculated intraperitoneally into mice, previously inoculated subcutaneously with BCG, the distribution of *Str. equi* was chiefly in the neighbourhood of the skin lesion that had developed as the result of the BCG inoculation (Ascoli's anachoresis phenomenon).—J. E.

I. GUILLOT, G. (1934). Contribution à l'étude du bacille de Preisz-Nocard. **[Study of the Preisz-Nocard Bacillus].**—*Thesis for Docteur vétérinaire, Alfort.* pp. 153. 5 tables, 2 charts. [11 pp. refs.]

II. URBAIN. (1934). Contribution à l'étude du bacille de Preisz-Nocard. **[Study of the Preisz-Nocard Bacillus].**—*Bull. Acad. vét. Fr.* **7.** 350-351.

I. This monograph gives the results of the author's personal researches over a period of three years. The following are amongst the chief results.

The organism is frequently encountered in suppurative lesions in the horse, and is very often difficult to demonstrate owing to the presence of other organisms. It is pathogenic for most animals. Filtrable forms have been demonstrated. A weak toxin is secreted which is different from that produced by *Corynebact. diphtheriae.* The flocculation test is specific.

The difficulty of detecting the organism in lesions makes diagnosis by this means unreliable. Of other methods tried by the author, serological methods did not give satisfaction but a biological test for the detection of antitoxin in affected animals afforded very reliable results. The possibility of an allergic test calls for further investigation.

II. This is a summary of GUILLOT's thesis, presented by Urbain to the Academy.—GWILYM O. DAVIES.

PETRIE, G. F., & MCCLEAN, D. (1934). **The Inter-Relations of** *Corynebacterium ovis, Corynebacterium diphtheriae,* **and Certain Diphtheroid Strains Derived from the Human Naso-Pharynx.**—*J. Path. Bact.* **39.** 635-663. 9 tables. [16 refs.]

Part I of this paper is a study of the toxin and antitoxin of *C. pseudotuberculosis* (the Preisz-Nocard bacillus) and of *C. diphtheriae.*

By carefully controlled experiments of various kinds, the authors arrive at the conclusion that there is no relation between the toxins of *C. pseudotuberculosis* and *C. diphtheriae.* Media which yield a potent diphtheria toxin have no stimulating effects on strains of *C. pseudotuberculosis* and there appears to be no similarity between the Schick reaction and that resulting from the intracutaneous injection of *C. pseudotuberculosis* toxin.

There is no foundation for the view that diphtheria antitoxin can neutralize *C. pseudotuberculosis* toxin. *C. pseudotuberculosis* antitoxin is present normally in variable amounts in the serum of a proportion of horses and, as this is more marked in concentrated sera of whatever kind, it seems to be a feasible explanation

of the discrepancy. The neutralizing effect for *C. pseudotuberculosis* of horse serum containing both diphtheria and *C. pseudotuberculosis* antitoxin is directly proportional to its *C. pseudotuberculosis* antitoxin content and is not perceptibly influenced by the amount of diptheria antitoxin present.

Part II concerns the toxins and antitoxins of a group of aberrant diphtheroid strains derived from the human nasopharynx and their relationship to *C. diphtheriae* and *C. pseudotuberculosis*. In the main it is supplementary to the work of BARRATT [(1933). *J. Path. Bact.* **36.** 369]. In the course of these investigations a definite relationship has been shown to exist between all strains, the aberrant diphtheroids linking together the extreme types *C. diphtheriae* and *C. pseudotuberculosis*. Whenever the characters of the aberrant strains differ from *C. diphtheriae* they approach those of *C. pseudotuberculosis*.—GWILYM O. DAVIES.

DACHENA, G. (1934). Sur la mammite des brebis et des chèvres due au bac. pyogènes. [**Mastitis of Ewes and Goats caused by** "*Bacillus pyogenes*"].—*Boll. Sez. ital. Soc. int. Microbiol.* **6.** 284-288. [Orig. in French].

The condition described, which the author notes has only previously been recorded by OLT and by DAMMAN and FREESE, was observed in four flocks of sheep containing 1,480 animals and in a herd of 150 goats, about 30 to 40 per cent. being attacked.

The first phase was usually characterized by small pustules and crusts on the surface of the udder or teats. This was quickly followed by the formation of small firm nodules which later softened and burst, either externally or into the interior of the gland, when pus appeared in the milk. Marked alterations then appeared in the gland itself which led to atrophy and distortion. The pus was of a greenish yellow colour, creamy and had an unpleasant odour.

The causal organism is misdescribed as "*B. pyogenes*". It was a non-motile, Gram-positive rod, 3 to 5 $\times$ 0·3 μ. Growth was slight in the case of both liquid and solid media even after several days. Milk was acidified and coagulated. Gelatine and coagulated serum were not liquefied, no growth occurred on potato, and lactose, galactose, glucose and mannite were not fermented. Indol was not produced. Death was produced within two days by the subcutaneous or intraperitoneal inoculation of 0·5 to 1 c.c. of culture in guinea pigs or rabbits, and also intravenously in the latter animal.

Inoculation of cultures into three sheep and three goats *via* the teat canal or into the substance of the gland produced local symptoms, pus formation of a moderate character and persistence of the organism.—A. W. STABLEFORTH.

DUCKSBURY, C. H. (1934). **Polyarthritis in Pigs, in Relation to the Bacillus of Swine Erysipelas.**—*Vet. Rec.* **14.** 884-885.

Of 22,000 well nourished pigs showing no symptoms of disease, 30 were found on *post-mortem* inspection to have lesions affecting the joints and associated lymphatic glands. Material from six cases submitted for bacteriological examination revealed the bacillus of swine erysipelas in four instances.—CHAS. R. TURBET.

JEAN, E. A. E. (1934). Pouvoir pathogène et localisations du bacille du rouget dans les différentes espèces animales. [**Pathogenicity of** *Erysipelothrix rhusiopathiae* **for Different Animals**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 45. [21 refs.]

This is a general account of the disease. In sheep only joint lesions are observed and the infection can be traced to a recent infection of swine in the locality. In birds, the joints of the legs are affected. As the organism is excreted

in the faeces, an infected bird may act as a carrier. Arthritis is produced in man as a result of infection. Joint lesions may be obtained in rabbits by subcutaneous inoculation and, if a joint is injured, the lesions will be set up in that joint.

—N. H. BROOKSBANK.

CERNAIANU, C. (1934). Nouvelles recherches sur la paratyphose du pigeon. Essais de vaccination en milieu très infecté. [**Vaccination Trials against Pigeon Paratyphoid**].—*C. R. Soc. Biol. Paris.* **116.** 264-266. [1 ref.]

The author describes an outbreak of pigeon paratyphoid caused by *Salmonella typhi-murium* (formerly *Bact. enteritidis* Breslau), in which 160 birds died in two months. This epidemic was terminated by inoculation with a vaccine prepared from the infecting strain of organism.—E. J. PULLINGER.

LAMONT, H. G., KERR, W. R., & SHANKS, P. L. (1934). **Investigation by the Veterinary Research Division, Ministry of Agriculture. Contagious Abortion.**—*Rep. agric. Res. Inst. N. Ire. 1933-34.* pp. 34-35.

This report contains a short account of the use of a dead vaccine against bovine contagious abortion. Half of the herd at the research station and half of the fresh heifers entering the herd in 1933 were so treated, the other half being given live vaccine.

The preliminary results are described as encouraging.—J. E.

LÜBKE, A. (1934). Untersuchungen an einer latent infizierten, mit der Milch Bangbakterien ausscheidenden Kuh. [**Studies on a Latently Infected Cow which Excreted *Br. abortus* in the Milk**].—*Arch. wiss. prakt. Tierheilk.* **67.** 436-452. 5 figs., 2 tables. [20 refs.]

A detailed study, extending over 14½ months, was made of a cow which was excreting *Br. abortus* in all quarters of the udder, guinea pigs being inoculated and cultures made regularly ; in the latter part of the study this was done every 14 days. Whey titres were also tested, presumably at the same intervals.

Br. abortus was obtained from the two hind quarters and the right fore quarter on every occasion but only on two occasions from the left fore quarter. The left hind quarter was the worst affected, had the highest whey titres, 1 : 200 to 1 : 8,000 during lactation, and 1 : 800 to 1 : 32,000 during the drying period, and produced the least milk ; the milk was, moreover, the most altered in character. The left fore quarter showed the lowest whey titre, 1 : 40 to 1 : 1,600 during lactation and 1 : 200 to 1 : 32,000 during the drying period. It produced the most milk, which was, moreover, normal in character. Cultural tests never showed any evidence of mastitis streptococci or other pathogenic aerobes. The titre of morning and evening samples varied notably but fore milk and strippings gave similar results. The rise of whey agglutinin during drying was associated with a parallel rise of blood titre and also with an increase of brucella.

The animal, which was not pregnant, was finally killed and material from various organs injected into guinea pigs. Besides the udder, *Br. abortus* was isolated from mammary lymph glands, from the uterine mucus and mucous membrane and from the right kidney, but not from the liver, spleen, gall-bladder or bile. Those from the mammary glands are believed to have been the most virulent, those from the kidney few in number and of very slight virulence.

Histological examination showed chronic interstitial mastitis with necrobiotic changes in the reticulum cells of the glands, pus-formation in uterine glands, and interstitial nephritis. No changes were present in the spleen, liver, gall-bladder or mesenteric lymph glands.—A. W. STABLEFORTH.

LÜBKE, A. (1934). Beitrag zur Frage der Bang-Infektion des Kalbes. [*Br. abortus* **Infection in Calves**].—*Arch. wiss. prakt. Tierheilk.* **68.** 233-249. 5 figs., 2 tables. [17 refs.]

The author has studied the symptoms, *post-mortem* lesions and the histopathology of two calves artificially infected with *Br. abortus*. Lesions were found chiefly in the lymphatic glands, liver and kidneys, and, in general terms, consisted of hyperplasia of reticulo-endothelial cells. The lesions in the kidney of one calf are described as a nodular, subchronic, interstitial lymphocytic nephritis. The histopathology in the calves was similar to that encountered in guinea pigs. In a third calf, naturally infected with *Br. abortus* at birth, lesions of a similar nature were encountered.

The author had hoped to learn, by a study of the progress or regression of lesions, whether calfhood infections with living vaccines tend towards spontaneous healing. Results, in this connection, were inconclusive.—E. J. PULLINGER.

KARSTEN, & BISCHOFF. (1934). Die Feststellung der Abortus-Bang-Infektion des Rindes durch die Untersuchung der Milch. [**The Diagnosis of** *Br. abortus* **Infection in Cattle by Milk Tests**]. *Dtsch. tierärztl. Wschr.* **42.** 465-469. 1 table. [1 ref.]

Of 187 *Br. abortus*-infected samples, 98·4 per cent. were detected by guinea pig inoculation whilst 41·3 per cent. were detected by culture on glycerin-serum agar with gentian violet and malachite green (1 : 200,000 of each) in an incubator specially constructed for the use of additional carbon dioxide. White rats and mice were less satisfactory than guinea pigs.

For diagnosis, the combination of agglutination and complement-fixation tests was better than either alone. Whey tests detected about 15 per cent. less infected animals than did the corresponding blood tests (900 infected animals). In general the percentage of brucella-containing samples rose in accordance with an increase of the antibody titre of the whey but in about 5 per cent. of infected milks both serological tests were negative. If full guarantee that the milk of a herd does not contain *Br. abortus* is desired the herd must be free from abortion infection. In milk control all cows which give serologically positive whey must be excluded and doubtful results checked by cultural methods. A.W. STABLEFORTH.

SCHELLNER. (1934). Ueber die Bruzellose des Pferdes. Experimentelle Untersuchungen. [**Equine Brucella Infection**]. *Tierärztl. Rdsch.* **40.** 762-764. 3 tables. [9 refs.]

Using three recently isolated strains of *Br. abortus* of bovine origin and two of equine origin, the author carried out infection experiments in 11 horses. Three horses were inoculated intravenously ; six were infected *per os* and, in the remaining two, the cutaneous route was adopted. Positive agglutinating titres developed after intravenous infection, and cultures from the blood of the three horses were positive until the 9th, 16th and 17th days respectively. The agglutinating titres of all three were negative again after eight months. Apart from a slight indisposition, which lasted for a few days immediately following the intravenous injection of the bacteria, none of the animals showed any clinical symptoms or signs of fever during the eight months' period of observation. Five of the six animals infected *per os* and both the animals infected cutaneously developed positive agglutinating titres, but in no case could brucella be isolated from the blood. D. R. WILSON.

CANTANI, A. (1934). Tentativi di differenziazione del Bang e del melitense mediante culture in latte di diversa origine. [**Differentiation of** *Br. abortus*

and *Br. melitensis* **by Cultures in Different Milk Samples**].—*G. Batt. Immun.* **12.** 322-324. [English, French and German summaries]. [Abst. from abst. in *Zlb. Bakt. I.* (*Ref.*). **114.** 61].

Freshly isolated *Br. abortus* did not grow at once when inoculated into milk of caprine or human origin, but grew without difficulty in cows' milk. On the other hand *Br. melitensis* grew equally well in all three types of milk.—J. E.

SCHNÜRER, J. (1934). Die Bang-Infektion bei Mensch und Tier. Gegenwärtiger Stand der Lehre von der Bang-Infektion beim Tier und deren Bekämpfung. [*Brucella abortus* **Infection in Animals and Human Beings. Present Knowledge of the Infection in Animals and its Control**].—*Wien. klin. Wschr.* **47.** 293-295. [Abst. from abst. in *Zlb. Bakt. I.* (*Ref.*). **115.** 112-113].

This is just a summary of the modern knowledge of *Br. abortus* infection in animals.—J. E.

I. DUNCAN, A. C., & GROVE-WHITE, J. H. (1934). **Undulant Fever.**—*Vet. Rec.* **14.** 853-854.

II. SMITH, J. (1934). **Sources of Infection in Undulant Fever.**—*J. Hyg., Camb.* **34.** 242-249. 3 tables. [33 refs.]

I. The authors record a case of undulant fever in a veterinary surgeon. They point out that it is well known that infection is often of a mild nature and may remain latent, producing no clinical symptoms. They recall the test made on the blood of nearly 100 veterinary surgeons at the Folkstone Veterinary Congress in 1932, when 23·8 per cent. of those constantly in contact with cattle reacted to the agglutination test of their blood and, of those not in contact with cattle, only 3·1 per cent. reacted.

The veterinary surgeon, whose illness is reported, only consumed milk, supplied to his household, which came from cows free from tuberculosis and contagious abortion, so that infection was apparently not due to milk. The patient had been constantly in contact with cattle and had removed a premature calf from a cow which reacted to the abortion test in February, 1934. As his symptoms of intermittent pyrexia commenced in January, it must be assumed that infection took place prior to this. The facts were also in accordance with recorded opinions that the patient was in a low state of health due to domestic worry.

II. The author carried out a series of experiments in Aberdeen in order to determine the extent of the presence of *Br. abortus* in cattle and in other animals and their products. He reviews the literature dealing with its extent and infectivity in human beings and the type of organisms present in this country.

Guinea pig inoculation was used throughout the experiments and 50 c.c. of milk was utilized for testing for the presence of *Br. abortus* in individual cow samples. In a herd which had been vaccinated with living abortion vaccine from one to two years previously, 12·5 per cent. excreted *Br. abortus* in their milk, whereas milk from other cows, sent in for examination for *Mycobact. tuberculosis*, only showed *Br. abortus* present to the extent of 6·7 per cent.

Guinea pig inoculation failed to show the presence of the organism in any one of 79 samples of butter tested, which were from various sources, including foreign, but five out of 51 samples of local butter contained *M. tuberculosis*. *Br. abortus* was not demonstrated in samples of ice cream.

Similarly, no *Br. abortus* was found in 63 samples of cheese examined, though two out of six locally prepared cheeses were found to contain *M. tuberculosis*.

The author then attempts to classify the types of persons affected with undulant fever according to their ages and occupations.

The examination of sera from sheep failed to show that these animals became affected with *Br. abortus*, nor could this organism be detected in the sera and organs of pigs.—D. S. RABAGLIATI.

THORSHAUG, K. (1934). Byldesyke hos sau - fremkalt av B. purifaciens. [*Bact. purifaciens* **Infection of Sheep**].—*Norsk. VetTidsskr.* **46.** 377-387. 2 figs. [3 refs.] [German summary : abst. from orig.]

The *Bact. purifaciens* infection of sheep, previously described as occurring in Sweden and Denmark, has been observed in different parts of Norway in the form of a pyaemia accompanied by suppuration, chiefly in the subcutaneous tissue and the lymph glands of the head. Abscesses are seldom found in the lungs, kidneys, liver and udder. Infection often seems to occur through small wounds on the mouth and lips.

Pseudotuberculosis is common in goats in Norway, and is aetiologically identical with caseous lymphadenitis of sheep. Infection can be transmitted from the one species to the other.—L. SLAGSVOLD (OSLO).

I. SCHORNAGEL, H. (1934). Infecties door anaërobe bacteriën bij het varken. [**Anaerobic Infections in Swine**].—*Tijdschr. Diergeneesk.* **61.** 634-637.

II. JANSEN, J. (1934). Infecties door anaërobe bacteriën bij het varken. [**Anaerobic Infections in Swine**].—*Ibid.* 638-642. [6 refs.] [English, French and German summaries : abst. from orig.]

I. Anaerobic infection in swine is less common than might be expected. The author describes three cases affecting the wall of the stomach (two of the pigs having suffered from swine fever) and three others from wound infection after subcutaneous injections or castration (the lesions being typical of gas gangrene). In all six cases there was a noticeable lack of cellular defence.

II. In five of the six pigs mentioned above, *Clostridium novyi* was isolated. *Cl. chauvoei* was isolated from the sixth pig, which had shown the symptoms of gas gangrene on the head and neck after a subcutaneous injection.

—J. VAN DER HOEDEN (UTRECHT).

TABUSSO, M. E. (1934). Septicemia gangrenosa ó edema maligno (Braxy) en los lanares. [**Malignant Oedema (Braxy) in Sheep**].—*Rev. zootéc.* **21.** 16-23.

The author takes a serious view of the appearance of braxy in Peru because, if the disease has been imported, which he considers to be probable, it may find ideal conditions on the slopes of the Andes, where extremes of temperature are experienced. The outbreaks recorded since the first appearance of the disease have occurred during the short rainy season.

When the disease was first observed, the in-contact animals were vaccinated with *Clostridium chauvoei* anatoxin with apparent success, but it is now definitely known that the aetiological agent, as in European braxy, is *Cl. septique*. Of 5,000 sheep vaccinated with *Cl. septique* anatoxin, only two died of braxy two days after vaccination. Of 2,000 unvaccinated sheep, 40 died of braxy. The author points out the advantage of anaculture over anatoxin in a country where transport is difficult.—R. S. ROBERTS.

CROISÉ, A. (1934). Le botulisme chez l'homme et les animaux. [**Botulism in Man and Animals**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 73. [49 refs.]

This thesis is essentially an essay, incorporating the available knowledge of the disease in man and animals. The matter is arranged and discussed under the

following main headings :—history, epidemiology, bacteriology, symptoms, diagnosis, prophylaxis and treatment.—GWILYM O. DAVIES.

DIENES, L. (1934). **The Growth of Capsular Substances Independently from the Bacteria.**—*Amer. J. Path.* **10.** 668-669.

Some bacteria, for example certain strains of *Bacillus subtilis*, produce excessive amounts of capsular material. This extra-bacterial material may grow out to a distance of 20 mm. from the colonies, forming a halo. This halo contains no bacteria, but it has been cultivated in four generations, as a transparent film on media containing saccharose. When stained, it appears as a hair-like growth of fine filaments differing from bacteria but resembling certain elements found in cultures of pleuro-pneumonia and agalactia.

The author concludes that the capsular substance represents living elements different from the usual bacterial forms.—GWILYM O. DAVIES.

MORI, N. (1933). La isopatinoterapia del farcino-criptocócico de los équidos. [**" Isopatin " Therapy in Equine Epizootic Lymphangitis**].—*Rev. Hig. Sanid. pecuar.* **23.** 739-745. [8 refs.]

The treatment referred to consisted of giving subcutaneous inoculations of small doses of a suspension of disintegrated pathological tissue from field cases of the disease, the name " isopatin " being applied to the product. Trials were carried out with this form of treatment in 1919, 1927 and 1928, and good results were consistently obtained. By 1928 it had been found that small doses were more effective than large doses and, in that year, five out of five mild cases, six out of seven intermediate cases (one case still under treatment at time of reporting) and six out of seven serious cases made complete recoveries in an average of 46 days. The optimum technique appeared to be to give repeated inoculations of small quantities at intervals of six days. Surgical treatment was deliberately withheld. No untoward symptoms followed inoculation with small quantities. In the three years mentioned, 28 horses were treated and, of these, only two failed to recover.—R. S. ROBERTS.

SARTORY, A., SARTORY, R., & MEYER, J. (1933). Le cycle évolutif des *Actinomyces* dans les cultures après passage à travers l'ultrafiltre de collodion. [**Development Cycle of Actinomyces in Cultures after Passage through Collodion Filters**].—*C. R. Acad. Sci. Paris.* **197.** 1465-1467. [4 refs.]

The authors have previously reported on clinical cases of actinomycosis in man in which they failed to demonstrate either mycelial forms or granules. They have also shown that a filtrable form of the organism exists which, experimentally, gives rise to an atypical form of the disease but, after passage through a series of animals, produces the typical lesion of actinomycosis.

In view of their findings, the authors pursued their investigations with reference to the existence of a filtrable form. Working with *Actinomyces bovis* Harz and other pathological strains, they were able to demonstrate that certain forms of the organism could pass through collodion membrane filters. They also found that the development of the organism was featured by certain well-defined stages. Some of these stages were morphologically stable.

[Readers interested in this subject should refer to the original for details of these development forms and the conditions under which they were produced].

—GWILYM O. DAVIES.

SCHMIDT, P. W. (1934). Ueber die Scherflechte bei Rindern. (Die in Westfalen

ursächlichen Trichophytonarten und durch sie hervorgerufenen atypischen Hauterscheinungen). [**Ringworm in Cattle. Species of Trichophyton in Westphalia**].—*Derm. Wschr.* **98.** 9-13. 3 figs. [5 refs.]

In northern Westphalia, the common ringworm infection of cattle is *Trichophyton rosaceum* ; this is also the case in human beings. *T. faviforme* and *T. gypseum asteroides* are seldom encountered. Typical cases of ringworm show bare patches of skin, with crust formation and desquammation of crusts in more advanced cases. Atypical cases, in which hairs sprout from the lesions, are rare.

—E. J. PULLINGER.

DISEASES CAUSED BY PROTOZOAN PARASITES.

MARTINS, V. (1934). Identificação de tripanosoma Pecaudi, e ensáio de tratamento, num animal enviado á Escola Superior de Medicina Veterinária pela Direcção do Serviços Pecuários de Angola. [**Identification of** *Tryp. pecaudi* **and Attempts at Treatment of the Infection**].—*Rev. Med. vet. Lisboa.* **28.** 6-23. 5 tables, 4 charts.

A dog received for study from Angola harboured a trypanosome which, from its morphology, period of incubation in experimental animals and the course of the disease in artificially infected rats, mice, guinea pigs, dogs and a donkey, was concluded to be *T. pecaudi.* Human serum had a marked preventive effect in experimentally infected mice and " Bayer 205 " had distinctly curative properties in larger animals.—R. S. ROBERTS.

—. (1934). **A Short History of Surra Treatment in the Punjab.**—*Indian J. vet. Sci.* **4.** 232-241. 1 table.

The subject matter of this paper is indicated in the title, although some of the experimental work considered was carried out elsewhere than in the Punjab. The period covered is 1893 to 1934. The work of LINGARD with arsenical preparations, of HOLMES and CROSS conjointly with arsenic and antimony, the studies of EDWARDS with potassium and bismuth salts, " tryparsamide " and " naganol " and the intravenous-intrathecal method of treatment originated by him, are dealt with successively in brief. The work of LEESE and the experiments of CROSS, which culminated in his well-known routine treatment by tartar emetic solution, are considered in more detail. The results obtained with " naganol " are then described, the modern " naganol "-tartar emetic method being dealt with at some length. The strikingly successful results obtained with this method led to the opening of 39 centres for treatment of camels and ponies in the Punjab in 1933 to 1934. A disadvantage of this treatment is the time required for the full course, namely, seven injections spread over 31 days. The paper ends with an account of some field experiments in prophylaxis based on the use of " naganol ".

—C. DAVENPORT.

CROOKS, K. B. M. (1934). **Cross-Infection Experiments on Parasite-Free Chicks with Intestinal Coccidia from the Rabbit.**—*J. Parasit.* **20.** 277-279. [10 refs.]

Attempts to infect chicks, during the first three days of life, with *Eimeria media* recovered from an outbreak of coccidiosis in rabbits, failed. [If the author had demonstrated that by his technique he could infect young rabbits with this oocyst, or that he could infect chicks with a coccidium specific to chicks, his experiments would have removed all doubt regarding the possibility of cross-infection of chicks with this parasite].—R. S. ROBERTS.

CARPENTIER, G. (1934). Les piroplasmoses des équidés, en particulier dans la métropole. [**Equine Piroplasmosis in France**].—*Rev. vét. milit.* **18.** 277-300. [12 refs.]

In view of the outbreaks of equine piroplasmosis reported from various provinces of France during recent years, the author reviews the whole subject of piroplasmosis as this disease has become of increased importance to the French army veterinary service. A short survey is given of the general characters of piroplasms and their classification, followed by a more detailed description of equine piroplasmosis. Both *Babesia equi* and *B. caballi* have been encountered in France. The former appears to have been enzootic for many years in Poitou where it causes a serious mortality in new-born mules which, apparently, contract infection *in utero*. No information is available as to the transmitter of this organism in France. *B. caballi* was first encountered in 1924, and it has been suggested that it may have been introduced by American horses during the war : the invertebrate host appears to be *Dermacentor reticulatus*.

For diagnosis, the author relies on the clinical symptoms and the detection of the parasites. In *B. caballi* infection, fever is persistent, the urine is red, anaemia is not marked and there is some paralysis of the hind quarters. In *B. equi* infection, fever is intermittent, the urine is black, there is severe anaemia but no paralytic symptoms. For treatment, trypan blue is efficacious against *B. caballi*, but not against *B. equi*, whilst piro blue has proved valuable in both infections, though, in those due to *B. equi*, a second injection is usually required. Recent work has tended to show that the dose of trypan blue formerly recommended is too large and may produce shock, whilst, for a horse, doses of 0·5 to 0·6 g. are sufficient for medicinal purposes. It is added that a suitable dose for cattle is 0·2 g. Very favourable reports have recently been received on the value of " gonacrine " in the treatment of both types of piroplasmosis, but further confirmation is required before it can be accepted as a specific.—U. F. RICHARDSON.

HERRANZ, N. A. (1934). Sobre la diferenciación de Piroplasma caballi y Nuttalia equi. A propósito del primer caso de nuttaliosis del caballo diagnosticado en España. [**The Differentiation of *Babesia caballi* and *B. equi* in Connection with the First Case of Nuttaliasis of the Horse Diagnosed in Spain**].—*Rev. Hig. Sanid. pecuar.* **24.** 247-265. 5 figs., 2 tables. [3 pp. refs.]

This paper is a thesis on piroplasmosis in the horse, with occasional references to original observations made by the author. Colour plates are used to illustrate the differences in morphology. The author concludes that a case examined by him was one of infection with *B. equi*. In connection with this case he observed that evolution of the parasite occurred in two cycles, by annular forms and by pyriform bodies.—R. S. ROBERTS.

THOMAS, A. D., & BROWN, M. H. V. (1934). **An Attempt to Transmit Canine Biliary Fever to the Domestic Cat.**—*J. S. Afr. vet. med. Ass.* **5.** 179-181. [3 refs.]

The authors describe unsuccessful attempts to transmit biliary fever of the dog to normal and splenectomized cats. Citrated blood of dogs actually showing the presence of *Babesia canis* was used for inoculating the cats. The natural tick transmitters of *B. canis*, *Haemaphysalis leachi* and *Rhipicephalus sanguineus*, are common parasites on cats and these animals must, therefore, be considered as insusceptible to biliary fever of the dog.—E. M. ROBINSON.

PAINE, R. (1934). **An Observation on the Preparation of Blood Smears for the**

Diagnosis of Piroplasmosis.—*J. S. Afr. vet. med. Ass.* **5.** 127.

The author stresses the importance of using the first drop of blood from the needle prick when making blood smears for the diagnosis of piroplasmosis. When a deep incision is made and blood flows freely, the parasites tend to be much rarer in slides made from it. It is suggested that infected corpuscles are enlarged and tend to become hindered by stasis in the small blood vessels of the skin.

—E. M. Robinson.

Bakker, S. (1934). Over anaplasmose. [**Anaplasmosis in Water Buffaloes**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 134-144. [English and German summaries : abst. from orig.]

The author describes the symptoms of anaplasmosis in water buffaloes. The most characteristic *post-mortem* features are swollen and moist lymph glands, swollen spleen with soft contents, yellow liver and pale-coloured organs.

Anaplasmosis often occurs together with surra, from which disease it can hardly be differentiated by clinical examination. A lasting immunity is developed and carriers do not show any symptoms. Regular dipping is very useful as a control measure. In the treatment of buffaloes, good results are obtained by the use of trypaflavin ; the required doses are, for adult buffaloes 1·4 g., for heifers 0·8 to 1 g. and for calves 0·25 to 0·5 g. of a 2 per cent. solution, administered intravenously.—J. van der Hoeden (Utrecht).

Jírovec, O. (1934). Ueber einige Spirochäten im Magensystem der Rinder. [**Some Spirochaetes in the Digestive System of Cattle**].—*Zlb. Bakt. I. (Orig.).* **131.** 109-111. 1 fig., 1 table. [1 ref.]

In the course of an investigation into the stomach fauna of cattle, the author encountered spirochaetes in smears that had been stained by Löffler's method for the demonstration of bacterial flagella, and in Giemsa preparations. The spirochaetes were not numerous, but could be detected in the ruminal contents of every animal examined. The organisms were commonly present in the reticulum, more rare in the omasum and practically absent from the abomasum. No spirochaetes could be detected in the stomachs of two calves which had been on an exclusively milk diet.

Three species of spirochaetes are described, of which one appeared to be identical with *Leptospira bovis*, except that it occurred amongst the ingesta instead of in the mucosae as recorded by Noguchi. The author proposes to name the other species *Spirochaeta pansenis* and *S. ruminantium*. [The possibility that these spirochaetes are saprophytic organisms taken in with the ingesta must not be overlooked].—U. F. Richardson.

Catchpole, Agnes M. (1934). **Leptospiral Jaundice in Silver Foxes.**—*Vet. Rec.* **14.** 376-378.

This article describes an outbreak of leptospiral jaundice on a silver fox farm. Attention was drawn to the disease owing to inappetence and loss of weight in one lot of cubs. Although the disease had not been previously recognized on the farm, only the young animals contracted the infection. Eight affected cubs were treated with antiserum and seven recovered. In-contact animals were treated with two vaccinations at ten-day intervals, but one animal died over a month after vaccination.—U. F. Richardson.

DISEASES CAUSED BY VIRUSES.

WALDMANN, O., & KÖBE, K. (1934). Der seuchenhafte Husten (infektiöse Bronchitis) des Pferdes. [**Infectious Bronchitis of Horses**].—*Zlb. Bakt. I. (Orig.).* **133.** 49-59. 2 tables. [16 refs.]

Infectious bronchitis (Hoppegarten cough, laryngo-bronchial catarrh, infectious catarrh of the respiratory tract) is a contagious disease of all classes of horse, characterized by a dry cough. Bronchitis and peri-bronchitis are seen *post mortem*. The condition is readily conveyed by contact from horse to horse, the average incubation period being from two to three days. The infection can be transmitted artificially by injection of susceptible animals with a cell-free filtrate of infected tissue. The virus is not particularly resistant to adverse conditions and is readily destroyed by drying and disinfectants. A secondary bacterial infection may follow the primary virus disease. This is characterized by high fever and the symptoms and lesions of broncho-pneumonia. The bacterial invader is a haemolytic streptococcus, probably identical with *Str. equi*. This secondary condition has been described by other authors as infectious broncho-pneumonia and Brussel's disease.

The pure virus infection in race horses, if treated immediately, lasts for two to three weeks. During this period the animal requires complete rest. Hard training can be recommenced one to two weeks after the cough has disappeared. Infection may be followed by a certain degree of immunity, but the immunity is not strong and may only reduce the severity of a subsequent attack. The virus can be transmitted to pigs, producing changes not unlike those associated with swine influenza. Cattle may also be infected and, possibly, the condition may be identical with that known as infectious broncho-pneumonia of cattle.

—E. J. PULLINGER.

THORSHAUG, N. (1934). Den smittsomme anaemi hos hesten, dens optreden og bekjempelse i Norge. [**Equine Infectious Anaemia in Norway**].—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 343-361. 3 figs. [English summary : abst. from orig.]

About 25 years ago equine infectious anaemia spread inwards from the eastern border districts, in the county of Hedmark, to the best horse-breeding districts in the country.

In 1922 the disease was placed by law among the dangerous infectious diseases of domestic animals ; infected horses and suspected cases were slaughtered at public expense, and at the same time steps were taken to prevent horses suspected of being infected from being sent to pasture with other animals. The result is that now, after ten years of control, the number of cases, which was as high as 70 a year, has been reduced to a very few.

Experience seems to show that the disease spreads most quickly on high-lying, marshy wooded districts, while the least affected areas are the lowlands and open mountain pastures.

When making a diagnosis it is necessary to consider the clinical examination, the family factor and histological examination, especially of the liver.

—L. SLAGSVOLD (OSLO).

RAMON, G., & LEMÉTAYER, E. (1934). Essais sur l'anémie infectieuse du cheval. [**Experiments on Equine Infectious Anaemia**].—*C. R. Acad. Sci. Paris.* **198.** 508-510. [2 refs.]

The authors record the successful transmission of infectious anaemia to a healthy horse by application of virulent serum to an old saddle gall. Another

horse, which survived experimental infection and which proved resistant to reinfection, was shown to give a serum infective to other horses, but was incapable of transmitting the immunity that it possessed. There is an account of some experiments carried out with a formalized virus, and a brief note on variations in the virulence of viruses obtained from different localities.—C. DAVENPORT.

ROSSI, P., & SAUNIÉ, L. (1934). Sur le diagnostic de la typho-anémie infectieuse du cheval au moyen des examens de laboratoire. [**Laboratory Diagnosis of Equine Infectious Anaemia**].—*Rev. vét., Toulouse.* **86.** 134-144. [13 refs.]

This article is a review of various laboratory tests which have been employed in the diagnosis of infectious anaemia, though by far the greater part of it is devoted to a consideration of the sublimate-precipitation test of Fulton. The divergent views expressed on the value of this test are considered, and details of the method and the interpretation of results are discussed at some length. This method has proved indecisive and disappointing in the authors' hands, the greatest measure of success not exceeding 70 per cent. of accuracy.—C. DAVENPORT.

GORET, P., & SANDOR, G. (1934). Etude du système lipo-protéidique du sérum des chevaux atteints d'anémie infectieuse. [**A Study of the Lipoid-Protein of the Serum of Horses affected with Infectious Anaemia**].—*Bull. Acad. vét. Fr.* **7.** 383-384. 1 table. [1 ref.]

This is a preliminary note on changes observed in the colloids of serum of horses suffering from infectious anaemia. The amount of lipo-protein which could be extracted from a given quantity of serum of an affected animal was found to be greatly short of that obtainable from an equal quantity of normal serum. Further, under the influence of the ether and alcohol employed in the above experiments, the character of the serum was found to change, an opalescence developing with certain concentrations of the alcohol, which varied according to whether the serum was taken from an affected or a healthy subject.

—C. DAVENPORT.

DAUBNEY, R. (1934). **Foot and Mouth Disease: The Fixed Virus Types.**—*J. comp. Path.* **47.** 259-281. 17 tables. [10 refs.]

In this paper Daubney draws attention to certain peculiarities of African strains of foot and mouth disease. He suggests that his experiments tend to confirm the findings of TRAUTWEIN, that " O " variants exist capable of infecting guinea pigs immune to the three standard strains, and of MANNINGER, that a virus may change its immunological state during the course of an outbreak.

Three strains from Kenya were studied. The first (" K " virus), immediately after isolation, protected guinea pigs completely against " A " and nearly completely against " C ", but by repeated passage a transition took place, so that the " K " virus eventually lost all its " C " component, appearing to become a normal " A ". Two other viruses, presumably identical with " K ", were also isolated ; one was finally fixed as an " A " type.

On the other hand, a strain obtained from Rhodesia was not identical with " K " at first, since it was able to infect, in part, animals immune to " C ", " K " and " A ", but failed to infect those immune to " O ". With repeated passage, however, the strain eventually established itself in " O " immune animals, whereas partial immunity was demonstrated with " A " and " C " viruses. At this stage the virus showed a marked similarity to the " K " strain. It proved impossible, however, to fix the strain as a pure " A ". A second Rhodesian virus from the same area infected eight cattle out of 14 immune to " K " and three out of 12

immune to the first Rhodesian virus ; it did not protect against " O " type. With repeated passage, this strain appeared to change until it became indistinguishable from " O ".—R. E. GLOVER.

ENZENBACH, H. (1934). Verschleppung der Maul- und Klauenseuche durch durchseuchte Weidetiere. [**Dissemination of Foot and Mouth Disease by Recovered Carriers at Pasture**].—*Münch. tierärztl. Wschr.* **85.** 281-284.

This article describes a wide-spread dissemination of infection during a period of six months by animals which had recovered from foot and mouth disease, but had apparently remained carriers of infection.—E. J. PULLINGER.

HELM, R. (1934). Maul- und Klauenseuche – Immunisierungsversuche an Meerschweinchen mit AD-Vakzine. [**Foot and Mouth Disease. Experiments on the Immunization of Guinea Pigs with " A.D. Vaccine "**].—*Z. InfektKr. Haustiere.* **46.** 284-295. 2 tables. [10 refs.]

The vaccines used in the experiments described consisted of the ground contents of the vesicles of guinea pigs reacting to inoculation with foot and mouth disease, diluted with various proportions of normal saline. Glycerol in varying quantities was added to the suspension in order to inhibit the denaturization of the proteins and the mixture was heated at 60°C. It was found that heating for 30 minutes did not always destroy the virus but, as the objective was to reduce alteration of protein to a minimum, heating for longer periods was not usually resorted to unless it was necessary to complete the destruction of the virus.

A course of three vaccine injections was followed, at varying intervals, by a test virus inoculation. Subcutaneous and intraperitoneal injections of vaccine led to a sensitization of the subject, which was indicated by more severe local reactions and a greater proportion of cases of generalization than occurred amongst control animals. This sensitization could be avoided by the addition of iodine to the vaccine or by the injection of potassium iodide three to five days prior to the administration of the vaccine.

The only evidence of protection was obtained with vaccines administered intradermally but, although the local reaction to the virus test was milder than in controls, one case of generalization occurred out of six animals in an experiment.
—U. F. RICHARDSON.

JANSEN, J. (1934). Intracerebrale injecties van mond- en klauwzeervirus bij caviae. [**Intracerebral Injection of Foot and Mouth Disease Virus in Guinea Pigs**].—*Tijdschr. Diergeneesk.* **61.** 567-569. 1 table. [Abst. from English, French and German summaries].

Guinea pigs were successfully infected by intracerebral inoculation with type A of foot and mouth disease virus obtained from vesicle lymph of guinea pigs infected by scarification. The infection became generalized. The virus was not demonstrable in the brain as determined by appropriate inoculation tests.—J. E.

SÁIZ, L. (1934). El diagnóstico histológico de la perineumonia exudativa. [**Histological Diagnosis of Contagious Bovine Pleuro-Pneumonia**].—*Rev. Hig. Sanid. pecuar.* **24.** 521-525. 4 figs.

The lesions of contagious bovine pleuro-pneumonia are described in detail. From a study of a large number of cases, the author has come to the conclusion that the only histological lesion which can be regarded as specific is that described by NIEBERLE. This is a necrosis of the oedematous zones, occurring in the form of bands,and foci of perivascular organization in the necrotic tissue.—R. S. ROBERTS.

SRIKANTAIAH, G. N. (1934). **Rinderpest in Sheep, with a Special Reference to Artificial Infection.**—*Indian vet. J.* **11.** 104-108. 1 table, 1 chart. [8 refs.]

This article records observations on the infection of sheep with rinderpest and the effect on the virus of its passage through sheep. On a test of goat virus on six sheep, a 50 per cent. mortality occurred, and it would appear that goat virus alone is unsatisfactory for the immunization of sheep and that the reaction should be controlled by the use of anti-rinderpest serum. Since the author considers that the passage of the rinderpest virus through sheep enhances its virulence, an attempt was made to increase the virulence of a laboratory strain of virus by passage through sheep. A satisfactory result is reported, but detailed evidence is not given.—U. F. RICHARDSON.

HAIDINGER, H. (1934). Ueber die Verwertbarkeit der histopathologischen Veränderungen der Nieren zur Schweinepestdiagnose. [**The Importance of the Microscopic Kidney Lesion in the Diagnosis of Swine Fever**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 649-650].

Seventy-eight kidneys, 41 from cases of swine fever and 37 from cases of other diseases in swine, were examined histologically to see if specific changes were present in swine fever and so to enable the method to be used in diagnosis.

Renal perivascular infiltrations were found in all cases of swine fever and also in many other diseases, therefore the method is of no particular value in differential diagnosis.—J. E.

FIADEIRO, J. (1934). A imunisação activa contra a péste suina, em leitoes recemnascidos. [**Active Immunization against Swine Fever in New-Born Pigs**].—*Rev. Med. vet., Lisboa.* **28.** 87-90.

It was noticed that pigs on premises infected with swine fever did not contract the disease during the first few days of life. Eight pigs, when seven days old, were inoculated subcutaneously with 0·5 c.c. of a commercial virus, at three weeks old with 1 c.c. and at weaning with 2 c.c. No symptoms appeared. This was repeated with 17 pigs, the first inoculation being given on the 12th day after birth. One of these pigs developed typical swine fever after the second inoculation, but none of the others contracted the disease. This experiment was again repeated with 17 pigs and, a month after the second vaccination, swine fever appeared on the premises. Two of the experimental pigs died. This mortality was approximately the same as in the remaining pigs which had been immunized by the serum-virus method.—R. S. ROBERTS.

WALDMANN, O. (1934). Die Bekämpfung der Ferkelgrippe. [**Control Measures against Swine Influenza**].—*Dtsch. tierärztl. Wschr.* **42.** 606-608. 5 figs.

An article advocating attention to hygiene. A description of a type of pigsty is given, with dimensions and illustrative sketches. The structure, whilst being cheap to build, is claimed to fulfil all the recognized hygienic requirements. By the use of thick walls and a packing of straw between the ceiling and roof, warmth is retained and the incidence of respiratory disorders is lowered. Those interested are referred to the original article which is unsuitable for abstraction.

—E. J. PULLINGER.

KÖBE, K. (1934). Die Ferkelgrippe. [**Swine Influenza**].—*Dtsch. tierärztl. Wschr.* **42.** 603-606. [6 refs.]

The subject of swine influenza is discussed and the following conclusions are

reached. The condition is an enzootic disease of young pigs which is followed either by death or by chronic illness. It spreads from farm to farm, particularly as a result of the sale of stock. The condition in its more chronic form can be distinguished from chronic swine fever by the anamnesis, the clinical picture and the pathological anatomy. So-called chronic swine-sickness (" Schweineseuche ") is a bacterial disease secondary to swine influenza ; the secondary invader probably belongs to the genus *Pasteurella*. [Swine influenza has been the subject of considerable research in recent years and numerous articles have been abstracted in this *Bulletin*; one of the most recent being in Vol. **5.** 15].—E. J. PULLINGER.

SHOETENSACK, M. (1934). **Pure Cultivation of the Filtrable Virus Isolated from Canine Distemper.**—*Kitasato Arch.* **11.** 277-290. 6 figs. on 1 plate. [1 ref.] [Orig. in English].

The author describes the cultivation of a filtrable micro-organism from the nasal discharges and lungs in cases of dog distemper. Morphologically, it resembles *Asterococcus mycoides*. It is a facultative anaerobe which fails to grow on ordinary media, but forms very minute colonies on a special agar medium containing about one-third of its volume of defibrinated horse or rabbit blood.

It is stated that a culture of this organism in its sixth generation was injected subcutaneously into three puppies, one of which died, four days later, of a condition resembling acute distemper.—R. E. GLOVER.

JONNESCO, D. (1934). Recherches sur l'immunité naturelle du chien contre la rage et sur les neurotoxines. [**Research on the Natural Immunity of the Dog to Rabies and on the Neurotoxins**].—*Ann. Inst. Pasteur.* **53.** 664-680. 1 fig., 2 tables. [30 refs.]

The author states that approximately 1 per cent. of dogs resist intracerebral infection with rabies virus. Working with a dog that had resisted one intraocular and nine intracerebral injections of rabies virus, the following results were obtained. The serum of the dog was shown to have neutralizing properties at dilutions of 1 : 10 to 1 : 20 after from four to six injections. Brain tissue had no neutralizing value. It was also shown that, with each injection of virus, there was a progressive increase of eosinophiles in the blood. Although the dog had a natural immunity, the virus was found in its blood seven days after intracerebral inoculation.

The author also demonstrated that, after intracerebral injections, the serum of the resistant dog was very toxic for guinea pigs, the toxic power of the serum becoming less potent as the interval between the injection and the testing increased. The toxicity was due to neurotoxins. These toxins are not produced by the rabies virus but by the cerebral tissue, as they can be produced by injecting dogs intracerebrally with normal dog cerebral tissue. Guinea pigs and rabbits, which have recovered from the injection of dog serum containing neurotoxins, are extremely sensitive to intracerebral injections of rabies virus, that is, to the cerebral tissue injected along with the virus.—GWILYM O. DAVIES.

JANSEN, J. (1934). De gevoeligheid van de muis voor het virus van de ziekte van Aujeszky. [**Susceptibility of Mice for Aujeszky's Disease**].—*Tijdschr. Diergeneesk.* **61.** 761-763. [Abst. from English, French and German summaries].

Mice were regularly susceptible to the intracerebral inoculation of the virus of Aujeszky's disease (obtained from a rabbit) and 17 direct passages in guinea pigs were obtained with 100 per cent. mortality. Pruritus was a symptom. It was found that mice inoculated subcutaneously with virus possessed some immunity

against intracerebral infection, some test animals dying and some remaining well. The author intends to obtain, if possible, 100 passages in mice.—J. E.

I. Remlinger, P., & Bailly, J. (1933). Vaccination préventive du chat contre la rage. [**Preventive Vaccination of the Cat against Rabies**].—*Bull. Acad. Méd. Paris.* **110.** 577-581. [4 refs.]

II. Barnes, M. F., Metcalfe, A. N., Martindale, W. E., & Lentz, W. J. (1934). **Canine Rabies Experimental Vaccination. Second and Third Reports.**—*J. Amer. vet. med. Ass.* **84.** 740-751. 13 tables. [1 ref.]

III. Reichel, J., & Schneider, J. E. (1934). **Rabies Vaccine Protection Test.** —*Ibid.* 752-758. 4 tables.

I. The question of vaccinating cats against rabies is of considerable importance in Mohammedan and near-eastern countries, where this animal is often more domesticated than the dog, as well as living at liberty in considerable numbers. The records of some of the Pasteur Institutes show recent increases in the number of cases treated after cat bites. The vaccination recommended consists of the subcutaneous inoculation of two vaccines, at an interval of one or two days. Both vaccines are brain emulsions, made from rabbits or dogs dead of fixed virus, exposed to sulphuric ether, the first for 25 and the second for 23 hours. An annual reinoculation to maintain immunity is recommended, one inoculation of virus exposed to ether for 15 hours being used.

II. Commercial carbolized vaccines, given as a single injection, are apparently unreliable and do not immunize dogs. Chloroform-treated vaccine proved slightly more successful, but the degree of success obtained does not justify the expense, and proper sanitation methods and quarantine are the best means of controlling the disease at present.

III. In testing a number of rabies vaccines the authors have chosen the rabbit as the test animal, and intralingual inoculation as the route for the introduction of the infective dose, as they found the latter the most consistent in control animals, without being too drastic in action. The best results were obtained with an attenuated live vaccine, which proved 100 per cent. effective. Phenol-killed vaccine proved very reliable, and chloroform-killed vaccine nearly as good, but formolized or autoclaved vaccine was of no value.—Norman Hole.

Bendinger, G. (1934). Ueber Histopathologie eines pockenartigen Ausschlages der Ferkel mit spezifischen intracellulären Einschlüssen. [**Histopathology of a Pox-Like Eruption in Young Pigs, with Specific Intracellular Inclusions**]. —*Arch. wiss. prakt. Tierheilk.* **68.** 345-354. 7 figs. [19 refs.]

This pox-like disease occurred in young pigs, and the lesions from 16 cases were histologically examined. The disease was non-febrile and more mild than the true variola type. Transmission experiments in laboratory animals were negative. The lesions in the earlier stage consisted of swelling of the epithelial cells of the epidermis and vacuolar degeneration, oedema and hyperaemia in the dermis, lymphocytic and histocytic infiltration, perivascular in distribution. Haemorrhage in the dermis occurred at a later stage. The lesion was considered to be a local inflammatory condition of the skin with degeneration of the epithelium, particularly of the stratum malpighii. Acidophile inclusion bodies were observed in the vacuolated epithelial cells and were considered to be probable virus colonies. They stained pinkish with eosin, but were negative to Gram-Weigert and Giemsa stains and gave no reaction for lipoid. Secondary infection sometimes complicated the histological picture. The disease was considered to be due to a dermatropic virus.—J. R. M. Innes.

JANSEN, J., & NIESCHULZ, O. (1934). Over de gevoeligheid van ratten voor het hoenderpestvirus. [**Susceptibility of Rats to Fowl Plague Virus**].—*Tijdschr. Diergeneesk.* **61.** 15-17. [English, French and German summaries: abst. from English summary].

By means of intracerebral injections with fowl plague virus the authors succeeded in infecting rats. The infected rats died after 3 to 8 (mostly 4 to 6) days, with symptoms of paralysis.

In the fourth and fifth passage the virulence of the virus was unattenuated when injected into fowls.—J. E.

ROUS, P., & BEARD, J. W. (1934). **A Virus-induced Mammalian Growth with the Characters of a Tumor (the Shope Rabbit Papilloma). I. The Growth on Implantation within Favorable Hosts. II. Experimental Alterations of the Growth on the Skin: Morphological Considerations: the Phenomena of Retrogression. III. Further Characters of the Growth: General Discussion.** —*J. exp. Med.* **60.** 701-722, 723-740 and 741-766. 49 figs. on 11 plates. [76 refs.]

As the result of an experimental comparison of SHOPE's rabbit papilloma [(1933). *J. exp. Med.* **58.** 607] with recognized neoplasms, the view is expressed that the former, as occurring in nature, falls into the group of infectious warts. The articles comprise a large number of detailed experiments, which do not lend themselves to abstraction, but the results may be briefly summarized as follows.

In its natural position (the skin), the tumour ceases to extend laterally after a time, although the cells continue to proliferate. The barrier to extension seems to be determined by the formation of a layer of dense connective tissue. Stimulation by the injection of Scharlach R or by covering young papillomas with collodion, seems to render the growths highly irregular and somewhat invasive. It is suggested that, with prolonged irritation, malignancy would have eventually resulted.

In addition to the characteristic skin lesions, growths develop in internal organs following the implantation of papillomatous material. The liver, spleen and voluntary muscles are the most favourable sites, but nodules may be found elsewhere (lung, kidney, etc.). The internal growths definitely proliferate and may cause death. They apparently result from the survival and multiplication of the transplanted cells. The virus can be recovered from these situations, but it is postulated that it is mainly specific for the epithelium of the skin and, in the absence of the papillomatous cell, is unable to establish itself in other sites.

Secondary nodules sometimes occurred in the lungs and lymphatic glands, but is was not definitely established that they were true metastases.

—R. E. GLOVER.

KUTTNER, Ann G., & WANG, S. H. (1934). **The Problem of the Significance of the Inclusion Bodies found in the Salivary Glands of Infants, and the Occurrence of Inclusion Bodies in the Submaxillary Glands of Hamsters, White Mice and Wild Rats (Peiping).**—*J. exp. Med.* **60.** 773-791. 9 figs. on 2 plates, 2 tables. [26 refs.]

Characteristic acidophilic intranuclear bodies were found in the submaxillary and parotid glands of infants, including a number of still-births. Attempts to transmit a possible virus to young guinea pigs and other small animals were entirely unsuccessful.

The submaxillary glands of hamsters, white mice and wild rats showed similar inclusion bodies. Transmission experiments suggested that they represent

a group of viruses each of which is species-specific and which, on intracerebral inoculation, produce lesions similar to those described by HUDSON and MARKHAM [this *Bull.* **2.** 501.] with the guinea pig submaxillary virus. Only very young animals were susceptible to infection.—R. E. GLOVER.

INVERTEBRATE VECTORS OF DISEASE.

DAUBNEY, R., HUDSON, J. R., & ROBERTS, J. I. (1934). **Preliminary Note on the Transmission of Bovine Haemorrhagic Septicaemia by the Flea** *Ctenocephalus felis* **Bouche.**—*J. comp. Path.* **47.** 211-213.

During an outbreak of haemorrhagic septicaemia, fleas were collected from apparently healthy calves and put to feed on healthy mice. A mouse died four days later, the *post-mortem* findings being typical of the disease.

An attempt to transmit the disease from a dead calf to mice by fleas was also successful. One mouse died four days after infestation and its blood was inoculated into four other mice with fatal results. Blood taken from one of these mice infected a calf which, after recovery, was shown to be immune.

The authors do not suggest that the disease is always flea-transmitted, but consider that such a possibility should be considered when cattle are kept in unhygienic surroundings in tropical countries.—GWILYM O. DAVIES.

DISEASES CAUSED BY METAZOAN PARASITES.

DAVIES, W. M. (1934). **The Sheep Blowfly Problem in North Wales.**—*Ann. appl. Biol.* **21.** 267-282. 3 tables. [20 refs.]

This is a detailed account of the sheep blowfly of North Wales, chiefly from the systematic standpoint.

Larvae were obtained direct from sheep and were kept, for identification purposes, until the development of the imago stage. Practically all specimens turned out to be *Lucilia sericata* Meig., whilst a very few were *Calliphora erythrocephala* Meig.

Sheep are attacked from May to October and to a greater degree in the lowlands than at higher altitudes. The life cycle varies between 36 and 80 days. It was found that the majority of maggots brushed away from the bodies of affected sheep – the common method of treatment – were able to complete their metamorphosis away from the ovine host : it is, therefore, very important to dip affected sheep with a suitable larvicide.

Considerable data collected showed that lambs were infested far more than the ewes.—J. E.

ORTLEPP, R. J. (1934). **Note on the Occurrence of the Tongue-Worm** – *Linguatula serrata* **in a Dog in South Africa.**—*J. S. Afr. vet. med. Ass.* **5.** 113-114. 1 fig.

In this short note the author records the occurrence of *L. serrata* in South Africa. It had not previously been recorded in that country and the symptoms shown by the dog are briefly stated. A short description is given of the parasite and of its life history.—E. M. ROBINSON.

BHALERAO, G. D. (1934). **On the Occurrence of** *Schistosoma japonicum* **Katsurada in India.**—*Indian J. vet. Sci.* **4.** 148-151. 1 fig. [5 refs.]

A brief description is given of five male schistosomes recovered from " the intestine " of a pig in Calcutta. Although the specimens show some slight variation from the description of *S. japonicum* (being slightly smaller and bearing tubercles on the cuticle), the author is of the opinion that they belong to that species. He points out, however, that, up to the present, there have been no records of *S. japonicum* infection of man in India.—E. L. TAYLOR.

MEIJER, W. C. P., & SAHAR. (1934). Over een lintworm van den hond, Diphyllobothrium raillieti Rátz en het bijbehoorende plerocercoid, Sparganum raillieti Rátz van het varken. [*Diphyllobothrium raillieti* **Rátz of the Dog and** *Sparganum raillieti* **Rátz of the Pig**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 1-12. 1 fig. [5 refs.] [English and German summaries : abst. from English summary].

In the Tapanoeli Residency of Sumatra, the plerocercoid form of *D. raillieti* is common under the peritoneum of pigs, whilst the adult form of this tapeworm is common in dogs.

The authors also infested a cat experimentally with the plerocercoid. Two attempts to infest man failed.

The literature is reviewed and a full description of the tapeworm is given. —J. E.

HENRY, A. (1934). Observations sur les anomalies du scolex de *Multiceps serialis* (P. Gervais). [**Anomalies of the Scolex of** *Multiceps serialis*].—*Ann. Parasit. hum. comp.* **12.** 384-389. 18 figs. on 2 plates. [4 refs.]

Anomalous morphology is of comparatively frequent occurrence in adult cestodes and is well known, but few observations have been made on anomalies in the larval stages. Henry has examined a number of the heads of *M. multiceps* (*Coenurus serialis*) from the rabbit and encountered many strange formations of the scolices, such as reduction of the number of suckers to 2 or 3, increase in their number to 5, 6, 8, 9 or 10, the existence of more than one rostellum, deformed hooks, and an increased or diminished number of hooks.—E. L. TAYLOR.

—. (1934). **The Broad Tapeworm in Dog and Pig.**—*Lancet.* **227.** 35-36. [3 refs.]

This annotation draws attention to recent work in North America and in Russia on the spread of *Diphyllobothrium latum.* Although the infectivity of the eggs from tapeworms harboured by dogs is relatively low, this animal must be regarded as of considerable epidemiological importance ; the pig is now also to be reckoned with as a potential factor in the spread of infection.—E. L. TAYLOR.

FREEBORN, S. B., & BERRY, L. J. (1934). **Observations on the Sheep Tapeworm,** *Moniezia expansa,* **in California.**—*J. Amer. vet. med. Ass.* **85.** 611-616. 1 fig. [5 refs.]

Observations as to the effect of moniezia infestation were carried out on 24 lambs which were divided into three groups ; a group of infested lambs, a group of lambs which had not been infested and a group of lambs from which the infestation had been removed by treatment.

Weights taken at the end of 77 days did not show any significant difference between the various groups, but when the lambs were graded by a competent judge it was found that the uninfested lambs were in much the best condition from a butcher's point of view.

Attempts to infest lambs experimentally were a failure, with one exception, where a cysticercus 15 mm. long and 6 mm. wide was recovered from the lumen of

the intestine 44 days after the administration of 500 onchospheres which had been incubated in a moist chamber for three weeks. Notes are given on the results of treatment with various mixtures of copper sulphate and nicotine sulphate, the demonstrated efficiency varying from 50 to 100 per cent.—E. L. TAYLOR.

DE WAELE, A. (1933). De overgang tot Lintworm van Cysticercus pisiformis, de vin van Taenia serrata (Goeze). [**Development of** *C. pisiformis*, **the Larval Stage of** *T. serrata* (**Goeze**)].—*Natuurwet. Tijdschr.* **15.** 155-162. 4 figs.

The evagination of neck and scolex does not occur at room temperature and in acid environment but takes place at 38°C. in a neutral or alkaline medium. Gastric juice has no influence but pancreatic juice and, in a lesser degree, saliva stimulate evagination. The action in bile is very rapid if acidity and temperature are optimal.

The capsule is digested in the stomach of the host but the neck and scolex will not evaginate before entering into the duodenum.

—J. VAN DER HOEDEN (UTRECHT).

TENHAEFF, C., & FERWERDA, S. (1934). Vergelijkende statistiek omtrent de echinococcosis bij het vee in Mecklenburg en Friesland en het gevaar van den heemhond als bron van infectie. [**Bovine Echinococcosis in Mecklenburg and Friesland and the Danger of Transmission by Dogs**].—*Tijdschr. Diergeneesk.* **61.** 169-180. 4 tables. [17 refs.] [Abst. from English, French and German summaries].

A review of the literature on the incidence of echinococcosis in animals and man, particularly in Holland and in the province of Mecklenburg, Germany. Infestation of cattle in Mecklenburg was much heavier than in Friesland, but infestation in man and in dogs was greater in Friesland. The authors attribute this to dissemination by both farm dogs and draught dogs, whereas in Germany there were no draught dogs to spread the parasites.

Since the institution of efficient meat inspection in Friesland, there has been a considerable decrease in echinococcosis.—J. E.

TAYLOR, E. L. (1934). **The Epidemiology of Winter Outbreaks of Parasitic Gastritis in Sheep, with Special Reference to Outbreaks which occurred during the Winter of 1933-34.**—*J. comp. Path.* **47.** 235-254. 6 tables. [11 refs.]

The author has studied the history of this epidemic by making careful analyses of a number of outbreaks in various parts of the country, enquiring into the history, taking average counts of the numbers of eggs per g. of faeces for the various flocks, making *post-mortem* examinations of the sheep, counting and differentiating the various species of worms, studying meteorological station reports and by carrying out laboratory experiments. Enquiry on the Romney Marsh in Kent showed that 43 farmers in that small area had suffered a loss of at least £10,341 as a result of the outbreak and, as the disease was wide-spread throughout England and Wales, the total loss must have been very great indeed.

Species of *Trichostrongylus* were principally concerned, *Ostertagia* and *Cooperia* were also sometimes present in large numbers, but *Haemonchus* and *Nematodirus* were usually absent, or only represented in very small numbers.

It is known that, at the stage when they are just ready to hatch, the eggs of *Trichostrongylus* are very resistant to dryness. Dew was found to be insufficient to cause hatching and it is thought that a storage of potential infective material occurred on the ground throughout the period of drought which lasted from late summer until

the late winter. The advent of wet weather conditions was followed by a mass liberation of infective material, which resulted in the wide-spread appearance of disease in January, February and March. The shortage of pasture is also considered to have been a potent contributory factor, as the intake of infective material is then at a maximum, the sheep having to graze closer to the ground for a longer period and over a wider area each day in order to satisfy their food requirements. Furthermore, as well as being low in quantity, the burned herbage on drought-ridden pasture is of a very poor quality and the sheep are often undernourished. Experiments, which are recorded, show that the rate of infection increases and the rate of elimination of the parasites is greatly reduced where sheep are on an inadequate diet. The combined action of these factors is considered to give an adequate explanation of the occurrence of this wide-spread epidemic of parasitic gastritis.
—E. L. TAYLOR.

HOSTETLER, E. H., & FOSTER, J. E. (1933). **Sanitation as a Method of Controlling Stomach Worms in Lambs.**—*Bull. N. C. agric. Exp. Sta.* No. 287. pp. 16. 1 fig., 10 tables.

A series of observations on ewes and lambs was carried out over a period of four years, comparisons being made between gains in weight and relative stomach worm infestation (*Haemonchus contortus*) in twin lambs and single lambs on permanent and on temporary pastures, periodically drenched with copper sulphate, or not drenched, some being fasted before drenching and some not fasted. These observations led to the conclusion that periodic drenching from June to October is imperative for the prevention of disease in lambs on permanent pasture. This precaution, however, is not necessary where lambs are grazing on temporary pastures, and untreated lambs on temporary pastures may thrive better than regularly treated lambs on permanent pasture. Single lambs appear, in general, to be more resistant than twin lambs ; fasting prior to drenching appeared to retard the rate of growth although, where fasting was practised, the subsequent drenching appeared to remove a greater proportion of the worms. Nodular worms (*Oesophagostomum columbianum*) were not noticeably affected by drenching, but their increase was somewhat checked by the use of temporary pastures. The decrease of stomach worms to below the infestation necessary for the production of disease may be effected by the systematic use of temporary pastures.—E. L. TAYLOR.

DE BOER, E. (1934). Over den invloed van vitakalk op de ontwikkeling van ascarislarven bij de cavia. **[Influence of " Vitakalk " on the Development of Ascaris Larvae in Guinea Pigs].**—*Tijdschr. Diergeneesk.* **61.** 750-760. 1 fig., 4 tables. [15 refs.] [Abst. from English, French and German summaries].

For a period of two months, 20 guinea pigs were given, in their daily ration, doses of 2·5 g. of " vitakalk " (a calcium-vitamin preparation) ; 10 control animals received no " vitakalk ".

100,000 mature eggs of *Ascaris lumbricoides* were then given to each animal and, four or five days later, all the animals were killed and examined. Ascaris larvae were searched for in the liver and lungs and, on a basis of the results, it is concluded that the specially dosed guinea pigs were no more resistant to infestation than the controls.—J. E.

CLAPHAM, Phyllis A. (1934). **Some Observations on the Effect of Dietary Deficiency on Infestation of Chickens with the Nematode** *Heterakis gallinae.*

—*J. Helminth.* **12.** 123-126. 1 table. [11 refs.]

Worm-free chicks were divided into two groups when four weeks old and fed on different diets, one group on an adequate diet and one on a diet deficient in calcium and phosphorus, being composed of yellow maize, white maize, tapioca meal, cod liver oil and cooked lean meat. After four weeks on the special diet, both experimental and control chicks received 200 infective eggs of *H. gallinae*. Twenty-four days later they were killed and the worms counted, and it was found that the infestation of those on deficient diet was heavier than in the controls, the average being 81·18 and 50·80 worms per chick respectively. Similar results were obtained on repeating the experiment, the average count of worms being 80·95 and 39·68 respectively. The number of chicks used in the experiment is not given, but statistical examination is stated to have shown the differences to be very significant.—E. L. TAYLOR.

DA COSTA MONTEIRO, A. (1934). Eustrongilose do cão. [**Eustrongylosis of the Dog**].—*Bol. vet. Exer. Brazil.* **1.** 191-193.

The author reports the identification of *Eustrongylus renalis*, found in the kidney of a dog in Brazil. The dog had been imported from Europe at a recent date.—R. S. ROBERTS.

LUCKER, J. T. (1934). **Development of the Swine Nematode Strongyloides ransomi and the Behaviour of its Infective Larvae.**—*Tech. Bull. U.S. Dep. Agric.* No. 437. pp. 30. 4 pp. figs., 7 tables, 1 graph. [27 refs.]

Reports of the observed pathogenicity of this parasite for pigs suggested the carrying out of this work. The author has investigated some phases of the life history of the parasite and the bionomics of its infective larval stage. Two moults have been observed to take place between the egg and the infective " filariform " larva and four moults between the egg and the free-living " rhabditiform " adult ; but only one moult has been observed in the parasitic phase of its life cycle. Infection can be brought about either in the natural host or in an experimental host (worms were reared to fertile maturity in rabbits) by skin penetration or *per os* : if infection occurs by skin penetration the larvae pass through the lung, but Lucker was unable to find any evidence that larvae introduced by the mouth required to do so. Nothing new appears to have resulted from the observations on the bionomics of the infective larvae, although several observations on the reactions of other species of *Strongyloides* larvae were confirmed. Air drying is lethal in nine to ten minutes, direct sunlight is lethal in 45 to 60 minutes, and temperatures ranging from –4° to –8°C. are lethal in 24 to 48 hours.

Chance observations on the pathogenicity of this parasite are also recorded. A reddening of the skin followed by a " pimple-like " eruption was observed where skin penetration had taken place, and marked diarrhoea occurred in several instances a few days after oral administration of larvae. One pig died, apparently as a result of a heavy infestation with the parasite.—E. L. TAYLOR.

PILLERS, A. W. N. (1935). **Some Remarks on the Clinical Aspect of Chronic Tracheobronchitis of the Dog due to** *Oslerus osleri* **(Cobbold, 1879).**—*Vet. Rec.* **47.** 62-63. [5 refs.]

Pillers adds three more cases to the 16 previously collected by HARE which, along with another observed occurrence that he is able to record, brings the total number of cases of chronic tracheo-bronchitis caused by this parasite up to 20. He describes a bronchioscopic examination which enabled him to make a definite diagnosis, and the removal of material from the bronchi for microscopic examination.

By using the bronchioscope in his case he was able to ascertain that the nodules contained living worms on June 6th ; on July 23rd the nodules appeared to be of about the same size, but on November 14th they had disappeared. This suggests that if reinfection is prevented the nodules do not persist indefinitely. The finding of larvae in the faeces, similar to those contained in eggs within the female *Oslerus*, is also mentioned. [Up to the present it has been uncertain whether embryonated eggs or larvae of this worm appear in the faeces. Pillers' observation on this point was confirmed at the Veterinary Laboratory, Weybridge, a few weeks ago].—E. L. TAYLOR.

HSU, H. F., & WATT, J. Y. C. (1933). *Dracunculus medinensis* **Infection in Two Dogs in Peiping.**—*Chin. med. J.* **47.** 1326-1330. 1 table. [6 refs.]

Infection with *D. medinensis* in Peiping has only once previously been reported in the literature and it is interesting that the authors should have come across two infestations in dogs in August and September, 1933.

They tried to work through the life history by infecting various species of *Cyclops* with larvae dissected from the parent worms, but, although infection of the *Cyclops* appeared to be successful, larvae being observed in the body cavities of *C. leuckarti*, *C. magnus*, *C. serrulatus* and *C. ternis*, these probable intermediate hosts unfortunately died before the completion of the five weeks which is thought to be necessary for the parasites to reach the infective stage.

—E. L. TAYLOR.

I. BUBBERMAN, C., & KRANEVELD, F. C. (1934). Over een dermatitis squamosa et crustosa circumscripta bij het rund in Nederlandsch-Indie, genaamd cascado. III. Het voorkommen van cascado bij de geit. [**" Cascado " (Verminous Dermatitis) in Cattle in the Dutch East Indies. III. " Cascado " in the Goat**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 67-73. 4 figs. [1 ref.] [English and German summaries : abst. from orig.]

II. BUBBERMAN, C., & KRANEVELD, F. C. (1934). Stephanofilariosis. IV. Over het voorkommen bij het rund op Java. [**Stephanofilariasis. IV. Its Presence in Cattle in Java**].—*Ibid.* 111-112. [English and German summaries : abst. from orig.] [For abst. of previous articles of this series, see this *Bull.* **4.** 663].

I. Cases of dermatitis caused by *Stephanofilaria dedoesi* have so far only been known to occur in cattle. It appears, however, that goats may also be affected, showing the same symptoms. The authors suggest that the names previously used, such as " cascado ", " abango " and " dermatitis verminosa pruriens bovis ", be replaced by " stephanofilariasis ".

II. The disease is wide-spread in cattle in the Dutch East Indies : it has been reported in North Celebes and the southern part of Sumatra as well as in Java.

—J. VAN DER HOEDEN (UTRECHT).

I. AUGUSTINE, D. L. (1934). **Studies on the Subject of Prenatal Trichinosis.** —*Amer. J. Hyg.* **19.** 115-122. [6 refs.]

II. TRAWINSKI, A., & MATERNOWSKA, I. (1934). Ueber Präzipitationsreaktion bei Trichinose. [**The Precipitin Reaction in Trichinosis**].—*Zlb. Bakt. I. (Orig.).* **131.** 10-18. 3 tables. [7 refs.]

I. Augustine produced experimental infestations with trichinae in pregnant rabbits, rats and pigs and carried out skin tests and blood examinations on a child from a mother who contracted trichinosis three weeks prior to parturition. No evidence was, however, found of the occurrence of pre-natal infestation having

taken place. The definite reason for this cannot be stated, but the feeble tissue-boring characters of the larvae and the acute reaction of the host to those larvae which fail to encyst within the muscle fibre may be responsible.

II. Experiments on rabbits showed that a specific precipitin reaction could be obtained in infestations of *Trich. spiralis*, 13 to 15 days after the experimental exposure had taken place. The antigen was prepared from trichinae digested out of rabbit's muscle, and the precipitin reaction took place in from 30 minutes to six hours at 37°C.—E. L. TAYLOR.

BACHMAN, G. W., MOLINA, R. R., & GONZALEZ, J. O. (1934). **Anomalous and Non-Specific Reactions with** *Trinchinella spiralis* **Antigen in Relation to Other Disease Conditions.**—*Amer. J. Hyg.* **20.** 415-423. [5 refs.]

The authors have taken advantage of the absence of trichinosis in Porto Rico to study anomalous and non-specific reactions to the precipitin test for infestation with *Trich. spiralis*. Some 857 individuals were tested, of whom 4·8 per cent. gave an anomalous type of reaction, 8·4 per cent. gave non-specific precipitin reactions and 87·5 per cent. gave negative reactions. The observations did not enable the authors to ascertain the cause of the non-specific reactions, but they concluded that a titre of 2,500 and above, in terms of the dry powdered trichinae, might be regarded as specific for trichinosis in 90 per cent. of cases.

—E. L. TAYLOR.

IMMUNITY.

DIRSCHL, F. (1934). Eignet sich die Ophthalmo-, Intrakutan- und Kutanreaktion zur Frühdiagnose der Banginfektion beim Meerschweinchen ? [**Comparison of the Ophthalmic, Intradermal and Dermal Reactions for the Diagnosis of** *Br. abortus* **Infection in Guinea Pigs**].—*Inaug. Diss. Munich.* pp. 41. 8 tables. [17 refs.]

Dirschl carried out experiments to ascertain whether it is possible to use ophthalmic, intracutaneous or cutaneous tests with abortin to detect early infection in guinea pigs. Abortin was prepared in three ways, viz. from cultures grown on glucose glycerin agar according to the method of van der Hoeden, from broth cultures in a manner similar to that of preparing " old " tuberculin, and from cultures of glucose glycerin liver agar in a manner similar to that of Koch's original tuberculin. Tests were carried out on groups of guinea pigs 7, 14 and 21 days after infection and were repeated in each after a week.

No difference was found between the reactions which were obtained in infected guinea pigs and in normal guinea pigs or those obtained with broth or glycerin solution. The ophthalmic, intracutaneous and cutaneous methods were tested on 65 normal and 48 infected, 48 normal and 48 infected, and 5 normal and 12 infected guinea pigs respectively.—A. W. STABLEFORTH.

SOTOLONGO, B. S. (1934). Tecnica de preparación de la agresina natural contra el carbunco sintomatico. [**Technique of the Preparation of Natural Blackleg Aggressin**].—*Bol. mens. Col. vet. nac. Havana.* **3.** 688-691.

The author describes the technique adopted at the Veterinary College, Havana. Calves are inoculated intramuscularly with a culture of *Clostridium chauvoei* and the muscle " tumour " is removed from the dead calves by dissection and then minced. The fluid from this is placed in cold storage for 90 days and then filtered under a low pressure. As it is believed that the immunizing properties of the

aggressin are dependent upon the virulence of the inoculated strain, a practice is made of recovering the strain from the lesions for future use.—R. S. ROBERTS.

HUBER, F. L. (1934). Antivirustherapie bij colpitis granulosa van het rund. [**Antivirus Therapy against Granular Vaginitis of Cattle**].—*Ned.-ind. Bl. Diergeneesk.* **46.** 267-279. 1 table. [Abst. from French and German summaries].

In a dairy near Buitenzorg, 23 cows were affected with granular vaginitis and were temporarily sterile. An antivirus was prepared by Besredka's method from streptococci isolated from affected animals and was applied direct to the vagina in the form of an ointment. Treatment was carried out daily and an improvement was stated to have begun after seven days ; after 14 days most of the animals were considered to be cured. Most of the cows were successfully bred and there was no relapse within the subsequent five months of observation.—J. E.

BRUNSWICK. (1934). Essais d'immunisation par inoculation du complexe : sang virulente et argent colloidal. [**Attempts at Immunization with a Mixture of Virulent Blood and Colloidal Silver**].—*Rec. Méd. vét.* **110.** 79-83.

The author has utilized the simultaneous injection of a citrate solution of colloidal silver (0·6 g. sodium citrate and 0·8 g. colloidal silver in 100 c.c. of distilled water) and virulent blood as a prophylactic against foot and mouth disease, purpura haemorrhagica, infectious equine paraplegia and equine infectious anaemia. Mixtures of 8 to 25 c.c. of blood were combined with 100 c.c. of silver solution and inoculated in doses of 20 c.c. Subcutaneous inoculation of the mixture produced extensive oedema which lasted several days. It is thought that the silver compound, in addition to producing oedema, has a specific action in lowering the virulence of the virus. It is claimed that these inoculations gave promising results in preventing the spread of infection.—E. J. PULLINGER.

BURNET, F. M. (1934). **Antigenic Differences between Related Bacterial Strains : a Criticism of the Mosaic Hypothesis.**—*Brit. J. exp. Path.* **15.** 354-359. 4 tables. [10 refs.]

Adopting the phage-inhibiting property of bacterial antigen as the basis of investigation, the author showed that, contrary to the mosaic conception of bacterial antigens, a Flexner dysentery bacillus extract is composed of immunologically similar antigen molecules and not of a mixture of antigens.—GWILYM O. DAVIES.

HEWITT, L. F. (1934). **Chemistry of Antibodies and Serum-Proteins. I. Nitrogen Distribution and Amino-Acids. II. Protein Carbohydrate Groups.**—*Bio-chem. J.* **28.** 2080-2087. 3 tables. [23 refs.]

This work was undertaken in order to investigate whether antibodies are specifically synthesized proteins quite distinct from normal serum-globulins, or whether they are derived from ordinary proteins by some slight modification, enabling them to combine specifically with antigens, as it has been shown by other authors that an increase in the globulin fraction is frequently observed during immunization, although no direct relationship between antibody production and globulin increase has been proved. Preliminary work on the characterization of horse serum-protein fractions and comparison with antitoxin preparations form the substance of this communication. The amide, monoamino- and diamino-nitrogen content as well as the cystine, tyrosine and tryptophane content of crystalline albumin, globulin fractions and diphtheria floccules was estimated, but it was impossible to differentiate antitoxins or diphtheria toxin-antitoxin floccules from

ordinary serum globulin. It was also concluded, from protein carbohydrate determinations by means of orcinol, that serum globulin and crystalline-serum-albumin are not apparently homogenous entities, but can be separated into fractions of widely different carbohydrate content. The chemical methods used are given in detail and are of value to those interested in this branch of immunology.

—JAMES STEWART.

DISEASES, GENERAL.

WYSSMANN, E. (1934). Weitere Mitteilungen zur Katarrhalfieberfrage. [**Further Notes on Malignant Bovine Catarrh**].—*Schweiz. Arch. Tierheilk.* **76.** 509-523 and 570-586. 10 figs., 1 table.

A further detailed account of malignant bovine catarrh in the canton of Berne, Switzerland, in 1933 [see this *Bull.* **4.** 666]. The results are discussed statistically and it transpires that the majority of cases were sporadic in the various affected herds and that, in three-quarters of the cases, a history of contact with sheep was confirmed. A further attempt to produce the disease in healthy cattle, by confining them in close contact with sheep removed from a farm on which a natural case had occurred, gave a negative result.

Wyssmann discusses malignant catarrh and " snotziekte " of South Africa and concludes that they are identical.—J. E.

BUCHLI, W. (1934). Das bösartige Katarrhalfieber im Münstertal, seine Ausbreitung und Behandlung. [**Malignant Bovine Catarrh in Munstertal**].—*Schweiz. Arch. Tierheilk.* **76.** 462-474.

This is an account of the incidence of malignant catarrh in a localized area in Switzerland during the period 1929 to 1934. The figures are considered statistically from several angles. The meteorological, geological and general farming conditions are discussed and records of seven cases, which were treated with normal sheep blood, are given ; four of these recovered.

Out of a total of 1,640 cattle, the incidence of the disease was ten cases per year and, in the five years under review, 44 out of 51 diagnosed cases died ; these were usually remote from each other and there was no evidence to support a theory of contagion as the causal factor. The presence of sheep was, however, noticed [see this *Bull.* **4.** 666].

In the author's experience, sudden changes of weather were significant in the incidence of the disease.—J. E.

HURST, E. W. (1934). **Calcification in the Brains of Equidae and of Bovidae.**—*Amer. J. Path.* **10.** 795-798. 4 figs. on 2 plates. [6 refs.]

Calcification of the vessels of the globus pallidus in man must be regarded as a phenomenon more or less normal with advancing years. In other territories it occurs less often but in connection with local pathological conditions. The author previously showed that a similar degeneration occurred in monkeys and this paper now records the same type of lesion in the brains of 17 horses, one being a Shetland pony, one mule and two cows, the majority of the animals being aged. The calcification in all of the cases was confined to the tunica media of the vessels, but with a concurrent intimal thickening. One horse, over 20 years of age, showed an extensive lesion in the dentate nucleus of the cerebellum. The calcareous deposits were positive to all the known microchemical tests for calcium salts in tissues. As many workers, including the author himself, have shown that calcification is often

bound up with the deposition of iron, a positive Prussian blue reaction for iron deposits was obtained. It seems probable that the calcification may represent a biological phenomenon of some constancy in advancing age in the higher mammals. [This type of calcification can also probably be brought into line with the quite common dystrophic medial calcification which occurs in the aorta of dogs, cows and horses. For a full account of the differential staining of calcium salts in tissues, reference should be made to CAMERON (1930). *J. Path. Bact.* **33.** 929.]

—J. R. M. INNES.

MROSS, M. (1934). Ueber die Veränderungen des Riechhirnes des Pferdes bei der Hydrocephalia chronica interna acquisita. [**Changes in the Olfactory Lobes of the Horse in Chronic Acquired Internal Hydrocephalus**].—*Inaug. Diss. Berlin.* pp. 36. 2 figs., 1 table. [18 refs.]

This is a detailed anatomical description of the numerous areas and regions of the olfactory lobes of the brain of the horse, and a comparison with the changes to be observed in hydrocephalus.—J. R. M. INNES.

VENTO, V. B. (1934). Die histologischen Veränderungen des Gehirns bei der Hydrocephalia acquisita des Pferdes unter besonderer Berücksichtigung der Neuroglia und Mikroglia. [**Histological Changes in the Brain in Acquired Hydrocephalus of the Horse, with particular reference to Neuroglia Reaction**].—*Inaug. Diss. Berlin.* pp. 19. 1 plate. [18 refs.]

There has been no explanation of the pathogenesis of acquired hydrocephalus in horses. Apparently some workers consider that the condition develops as a sequence to some inflammatory condition of the brain. The brains from four cases were examined histologically and, by using the various complicated impregnation methods for the demonstration of different cellular and fibrillary elements, the following lesions were observed :– fibrosis of the pia, thickening of vessel walls, dilatation of the perivascular lymph spaces, microglial reaction of but a minor degree, abundant production of " gitterfasern " and various degenerative changes in ganglion cells such as tigrolysis, hydropic swelling and neurophagia. All of these lesions correspond closely to those observed in atrophy of the brain in human beings which suggests that the condition is idiopathic and not inflammatory in origin.—J. R. M. INNES.

—. (1934). **Discussion on the Laryngeal Paralyses.**—*Proc. R. Soc. Med.* **28.** 201-210. 2 tables. [31 refs.]

DURWARD described the central connections of the laryngeal motor fibres and stated that the older view, viz. that the recurrent laryngeal nerve supplied all these muscles with the exception of the crico-thyroid, was more generally accepted today. The last-named muscle is supplied by the superior laryngeal nerve. The nucleus ambiguus is a long column of cells deeply placed in the medulla, providing fibres to the ninth, tenth and eleventh nerves.

JOLL alluded to the history of operations upon the thyroid gland since 1885. He discussed pre- and post-operative paralysis of the larynx and the methods of obtaining recovery of the vocal cord by nerve suture in cases of accidental division of the nerve. He commended the recurrent laryngeal-phrenic anastomosis, described by COLLEDGE and BALLANCE, as the most promising of these methods.

RIDDOCH said that the laryngeal motor fibres arose from the nucleus ambiguus. Regarding peripheral paralysis, it is of veterinary significance that he mentioned aortic aneurysm, mediastinal neoplasm and enlarged glands.

HOBDAY referred to the operation of stripping the ventricle of Morgagni for the relief of left-sided laryngeal paralysis in the horse. He specially emphasized that the object in view was to enlarge the glottis, and that the suppression of the voice was of no consequence.—E. P. ARGYLE.

STEFFAN, H. (1934). Das Herz bei inneren Erkrankungen des Pferdes. I. Mitteilung. Elektro- und phonokardiagraphische Untersuchungen. [**The Heart in Internal Diseases of the Horse. I. Electro- and Phonocardiographical Experiments**].—*Arch. wiss. prakt. Tierheilk.* **68.** 159-182. 10 figs., 1 table. [96 refs.]

In this lengthy contribution Steffan completes the first part of a series of experiments on the graphic method of recording the electric state of, and sounds produced by, the heart. After reviewing the literature, pointing out the history of electrographic methods and speculating on their use in the diagnosis of diseases of both large and small domesticated animals, he gives in detail the results obtained from four cases of tetanus, and three horses from which antitetanic serum was prepared. In the latter, the observations were made before and after the subcutaneous injection of large doses of toxin.

The clinical findings of the cardiac cycle are described with the interpretations of the electro- and phonocardiograms. In several cases the electrocardiogram is shown by the side of the phonocardiogram, so that the relationship of the rhythm and amplitude of the sounds to the deflections P. (auricular complex) and Q.R.S.T. (ventricular complex) can be compared. The discussion on the result obtained is lengthy, but the author maintains that, when the pictures of other diseases are known, they will be shown to be pathognomic. It is suggested that additional leads, over and above the three generally used in human medicine, may give a clearer insight into the cardiac cycle of horses.—A. W. N. PILLERS.

CLAUSSEN, L. (1934). Gefässmissbildung in der Lunge und auf der Zwerchfellpleura eines Rindes. [**Vascular Malformation of the Lungs and Diaphragmatic Pleura in a Bovine**].—*Dtsch. tierärztl. Wschr.* **42.** 754-756. 5 figs. [1 ref.]

This is a short description of a condition which is classified in most text-books as cavernous angioma. The growths were multiple and nodular and extended on to the diaphragmatic pleura. The histological features conformed in every way to the well-known description and need no reference. The author prefers to regard this condition as being not of a true neoplastic nature but as a malformation and uses the term "hamartoma" [first applied by ALBRECHT], but the question of histogenesis and whether these angiomata are in reality neoplastic has been discussed from the time of VIRCHOW without any satisfactory conclusion being reached.

—J. R. M. INNES.

REDLICH, E. (1934). Ueber eine eigenartige Gefässkrankheit und über spontane Aortenrupturen bei Ferkeln. [**A Peculiar Disease of the Blood-Vessels and Spontaneous Rupture of the Aorta in Piglets**].—*Arch. wiss. prakt. Tierheilk.* **68.** 195-207. 4 figs. [46 refs.]

Redlich gives a clinical and pathological account of a peculiar condition of the arteries of young pigs, ranging from two to three months of age, most of which died of ruptured aortae. The most marked changes consisted of atrophy of the layers of the arterial walls, with an increase of coloured substance and small inflammatory areas, chiefly in the abdominal aorta. At the same time, there were analogous, but more marked, changes in the coronary arteries, especially the left.

The condition is said to resemble periarteriitis nodosa. The cause does not appear to have been determined.—A. W. N. PILLERS.

HAMILTON, T. S., HUNT, G. E., & CARROLL, W. E. (1933). **The Prevention of Anaemia in Suckling Pigs, with Observations on the Blood Picture.**—*J. agric. Res.* **47.** 543-563. 7 figs., 1 table. [37 refs.]

Nutritional anaemia in suckling pigs is more common in early spring litters than in those farrowed in late spring, summer or autumn, though it may be induced in such litters by confinement indoors on concrete floors. Brushing the udders of the sows daily with dilute aqueous solutions of iron and copper, or iron alone, from farrowing till weaning time completely prevents anaemia in suckling pigs. As an alternative, the young pigs may be allowed access to a palatable mixture containing 0·1 per cent. of ferric sulphate after four weeks of the udder treatment. The authors found that, of 55 pigs farrowed without such treatment, 98 per cent. became anaemic and, of 38 pigs under the same conditions but receiving the above treatment, not one became anaemic.

The average haemoglobin concentration of 163 pigs less than 24 hours old was 8·98 g. per 100 c.c. of blood and the average cell volume of 98 pigs less than 24 hours old was 44·1 per cent. An interesting statistical study of the correlation between haemoglobin concentration in the blood and the cell volume during growth is given, as well as a valuable summary of the existing literature on anaemia in swine.—JAMES STEWART.

HAASE, M. (1934). Untersuchungen über Ziegenmilchanämie. [**Goats' Milk Anaemia**].—*Berl. tierärztl. Wschr.* **50.** 595-598. 1 table.

When animals receive a diet of goats' milk instead of cows' milk it is reported that they rapidly become ill and die. This paper is a brief review of the existing work on the subject. The disease is termed " goats' milk anaemia ", but little proof is forthcoming of a definite anaemia always being present, and several authors have failed to reproduce it. Young animals appear to be more susceptible than older animals. Different authors have attributed its cause to different factors, such as deficiency of iron or amino-acids in the milk, damage to the intestines, toxic bodies in the blood and deficiency of vitamin C. The last appears most likely, as several workers have cured apparent symptoms in guinea pigs by feeding vitamin C. Much more work will be necessary and more convincing results must be obtained before any of the present theories can be accepted.—JAMES STEWART.

HOFMEISTER, W. (1934). Beiträge zum normalen und pathologischen Blutbild des Huhnes. [**Normal and Pathological Blood Picture of the Fowl**].—*Inaug. Diss. Berlin.* pp. 21. 4 graphs. [39 refs.]

The normal differential white blood cell count for 200 Leghorns, one year old, living under hygienic conditions and having fresh air and exercise, is :– pseudo-eosinophiles 30 per cent., eosinophiles 2 per cent., basophiles 1·5 per cent., small lymphocytes 48 per cent. and large lymphocytes 17 per cent. In birds suffering from an acute experimental infection, the pseudo-eosinophile count rose rapidly after each infection and then quickly fell again. The small lymphocyte count dropped with infection and then rose again. In chronic experimental infection the differential count was :– pseudo-eosinophiles 35·5 per cent., eosinophiles 0·1 per cent., basophiles 5 per cent., small lymphocytes 40 per cent., large lymphocytes 19 per cent. and monocytes 2 per cent. In acute spontaneous disease the count was :– pseudo-eosinophiles 22 per cent., eosinophiles 1·8 per cent., basophiles 1·2 per cent., small lymphocytes 52 per cent., large lymphocytes 18 per cent. and

monocytes 5 per cent. In chronic spontaneous disease the count was :– pseudo-eosinophiles 9·5 per cent., eosinophiles 0·0 per cent., basophiles 2·9 per cent., small lymphocytes 76·5 per cent., large lymphocytes 10·3 per cent. and monocytes 1 per cent. The differential counts in disease were made on small groups of birds.
—E. J. PULLINGER.

GÖTZE, R. (1934). Impotentia coeundi infolge Dysfunktion der Afterpenismuskeln beim Zuchtbullen. Heilung durch Myotomie bei der Muskeln. [**Impotence of Bulls due to Dysfunction of the Musculus retractor penis. Surgical Treatment**].—*Dtsch. tierärztl. Wschr.* **42.** 589-592. 4 figs.

This is a paper given at the 1934 meeting of the " Deutscher Naturforscher und Aerzte " on conditions in bulls causing inability to copulate. These are :– (1) adhesions by fibrous bands between penis and prepuce (curable surgically) ; (2) inflammatory thickening of the preputial orifice (usually incurable) ; (3) inflammatory thickening of an internal preputial fold, blocking the way for the penis (incurable surgically) and (4) inability to straighten the penile S curve owing to excessive action of the retractor penis muscle. The cure of four cases by the severence of this muscle a short distance below the level of the ischium, under low sacral (epidural) anaesthesia, is described.—J. E.

COHRS, P. (1934). Kann man an Hand einer Nachgeburt deren genaue Lage im Uterus feststellen ? [**Can the Firmly Adherent Retained Placenta be Identified by Intrauterine Palpation ?**]—*Tierärztl. Rdsch.* **40.** 469-473. 2 figs. [2 refs.]

Retention of the placenta is commonly associated with chronic metritis and contagious abortion. Complete removal of such membranes can only be effected if the manipulator is entirely familiar with the anatomy of the organ and with the nature of the pathological condition. The anatomy is discussed and, with the aid of diagrams, an indication is given of the type of pathological condition which may be encountered within a diseased uterus. Those interested are referred to the original article, which is unsuitable for abstraction.—E. J. PULLINGER.

TASSI, L. (1934). Considerazione eziologiche e cliniche su un'enzoozia di cheratite dei ruminanti. [**Keratitis in Ruminants**].—*Clin. vet., Milano.* **57.** 558-562. 1 fig. [5 refs.]

In October, 1932, the author was called upon to deal with an outbreak of infectious keratitis amongst cattle and sheep. The animals became affected at about the same time, although they were in four localities at no little distance from each other. The symptoms were lacrymation, photophobia, opacity of the cornea, ulceration and the formation of granulation tissue round the eye. Treatment consisted of the application, once daily, of a few drops of a 1 per cent. silver nitrate solution, followed by washing the eyes with a 2 per cent. sodium chloride solution two hours later. In some cases recovery took place in ten to 15 days, whilst in others it was delayed for several months.—J. A. NICHOLSON.

MARSH, H. O., & TUNNICLIFF, E. A. (1934). **Experimental Studies of Foot-Rot in Sheep.**—*Bull. Mont. agric. Exp. Sta.* No. 285. pp. 29. 10 figs., 3 tables. [5 refs.]

The following are some of the interesting experiments carried out by the authors during the course of an exhaustive investigation into footrot :–

(1) A healthy lamb, placed on wet pasture with infected sheep, developed footrot in ten days. *Actinomyces necrophorus* was present in a practically pure state

in sections. Two ewes, placed in the same pasture, showed symptoms after 21 days and *A. necrophorus* predominated in sections made when the disease was advanced.

(2) *A. necrophorus* was seen in smears from 20 out of 22 cases and was isolated by rabbit inoculation in 21 of these. No spirochaetes were found.

(3) Four sheep were placed in a wet pen and *A. necrophorus* was inoculated into the feet by various methods. Four were left in the pen for four weeks and then inoculated. Although the strain of *A. necrophorus* used was known to be pathogenic, footrot did not develop.

(4) Two sheep were kept in pens and the mud on the floor was repeatedly inoculated with large volumes of *A. necrophorus* culture. No disease appeared.

(5) Soil from pens transmitting footrot, from clean pens and from the inoculated pen was inoculated into rabbits. *A. necrophorus* was demonstrated in the infected pens only.

(6) A series of experiments on the infectivity of pasture, justified the following conclusions.

" Healthy sheep regularly develop foot-rot when placed in a heavily infected pasture, after an incubation period of ten to fourteen days.

" Open corrals on well-drained land lose their infectivity within fifteen days if the soil is allowed to dry and within thirty days where the soil is continuously wet.

" In a heavily infected subirrigated swamp pasture, the infection may persist from one season to the next. A heavily infected, well drained, irrigated pasture loses its infectivity very rapidly when allowed to become dry."

(7) 34 infected sheep were surgically treated. Ten of them were dressed with antimony trichloride, eight were made to stand for two minutes in saturated copper sulphate solution (30 per cent.), nine were similarly treated with 1 per cent. sodium hydroxide and the remaining seven sheep were left as controls. All sheep treated in the copper sulphate foot bath made a complete recovery in one week. Only two sheep in each of the other treated groups recovered after one treatment and there was no spontaneous recovery in the controls.

The general conclusions are " that *A. necrophorus* is the primary infective agent in foot-rot but that there is another factor involved which we have been unable to discover ", and " that saturated (30 per cent.) copper sulphate solution is entirely satisfactory as a therapeutic agent for the treatment of foot-rot."

—R. S. Roberts.

Küssel, F. (1934). Beitrag zur Hämosiderose beim Hund. [**Haemosiderosis in the Dog**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 638-639].

The author tested the internal organs of ten dogs for haemosiderin. Macroscopically, the spleen, liver and lymph glands of the animals showed a brown discolouration and deposits of haemosiderin were identified histologically in all cases. The disease conditions in which haemosiderin was present included Stuttgart disease, peritonitis, carcinoma, sarcoma and diabetes.—J. E.

Valade, P. (1934). Tumeurs de la région peri-anale du chien. [**Neoplasms of the Peri-Anal Region of the Dog**].—*Rec. Méd. vét.* **110.** 385-390. 3 figs. [6 refs.]

This is a short anatomical and histological description of seven cases of tumours, referred to as sebaceous epithelioma, from the peri-anal region of the dog. Brief mention is made of the French literature concerning this well-known and common condition. It is considered that the relatively large number of sebaceous glands in this region must be considered as a predisposing cause, and

that chronic irritation may be an exciting factor. No new facts are presented.

—J. R. M. INNES.

HOLZ. (1934). Endokranielle epidermoidale Cholesteatome des Pferdes. [**Intracranial Epidermoid Cholesteatoma in the Horse**].—*Berl. tierärztl. Wschr.* **50.** 804-808. 6 figs. [49 refs.]

This is a careful clinical, anatomical and histological description of a tumour which is rare in human beings and animals. In a review of the literature the author mentions only six records, three in Germany, two in England (reported by MCFADYEAN) and one in France, all occurring in horses. The author's description of four further cases, three occurring in the course of a year, is of importance as, from his clinical description, it may be possible that other such cases have been missed because of the resemblance of the symptoms to those of an encephalitis. In two of the cases the tumours were located near the osseous tentorium and in a third case on the caudal pole of the right cerebral hemisphere ; all were related to the dura mater. This corresponds to the known facts. Histologically the tumours, with slight variation, showed the features which have been described for this type, viz. an outer connective tissue capsule with haemosiderin deposition, lamellated waxy or scaly material enclosed by a wall of well-developed stratified squamous epithelium and the presence of cholesterin and other lipoids.

[These tumours belong to the group of intracranial dermoids, epidermal growths, and must not be confused with the so-called psammoma or dural endothelioma, a separate neoplastic entity. The relations of the medullary groove to the ectoderm and the complex steps in the formation of the brain and ventricles give abundant sources for the formation of epidermal intracranial growths].

—J. R. M. INNES.

—. (1935). **Some Diseases of Poultry.**—*Bull. Minist. Agric., Lond.* No. 6. pp. v + 54. 27 figs. on 10 plates. London : H. M. Stat. Off. [8vo] [1s.]

The fourth edition of this bulletin supplies those interested with a very concise account of most of the important diseases of poultry occurring in this country.

The bulletin has been increased in size, and the information given about each disease in the previous edition has been brought up to date in the light of our present knowledge. New articles have been included on fowl plague and Newcastle disease. Internal and external parasitic infestations are fully dealt with and recommendations made for their eradication.

The publication has been very well produced and the illustrations are excellent. A copy of this work should be in the hands of all poultry owners.

—NORMAN DOBSON.

BRANDT, A. J. (1934). Pelsdyrsykdommer i Norge. [**Diseases of Fur-Bearing Animals in Norway**].—*4. Nord. Vet.-mötet. Helsingfors, 1933.* pp. 947-980. 13 figs., 1 table. [24 refs.] [English summary : abst. from orig.]

The report is founded on the extensive material examined by the Veterinary Institute, Oslo, during the past ten years. It deals chiefly with diseases of the silver fox, blue fox and mink. Parasites of importance are hookworms and ascarids in the digestive organs, and two different lungworms. Coccidiosis is also encountered. A thorough description is given of methods of control. Ectoparasites are also mentioned.

Distemper has not been observed among the infectious diseases, but colibacillosis has been noticed.—L. SLAGSVOLD (OSLO).

WEAVER, C. H., & BIRD, S. (1934). **The Nature of Cannibalism occurring among Adult Domestic Fowls.**—*J. Amer. vet. med. Ass.* **85.** 623-637. 11 tables. [2 refs.]

The incidence, seasonal distribution of the disease, and the condition of the cannibalized fowls are carefully compiled from 3,664 autopsies carried out over a nine-year period. In all, 440 deaths were recorded from this cause, giving an annual mean of 12 per cent. of all fatalities. A very decided increase occurred in recent years. The egg production of the cannibalized fowls was less than that of the normal fowls ; this was taken as an indication of the subnormal condition of the individuals comprising the group.

The evidence leaves little doubt that the cause of cannibalism is of a complex nature, but a large part of it was undoubtedly due to the low physical condition of the cannibalized birds, rather than to any diseased condition or vicious habit in the attacking birds. It would appear to be a survival of the fittest, the weaklings being killed off through a process of natural selection.—R. F. GORDON.

LAPOLLA, L. (1934). Sulla patogenesi della morte per penetrazione di aria nelle vene. [**Pathogenesis of Air Embolism**].—*Clin. vet., Milano.* **57.** 593-606. [39 refs.]

On the injection of air into the carotid arteries or jugular veins, the most constant symptoms are :- acceleration of the heart and respiration, shivering, movements of the head and neck, tonic spasms of the limbs, paralysis and sometimes death. 500 c.c. of air injected intravenously caused the rapid death of a horse, whilst 100 c.c. had no effect. The injection of 100 c.c. into each of the jugular veins of a dog also caused death. When air is injected intravenously, provided that it is given in sufficient quantities and quickly, it fills the right ventricle, which is thus unable to pump any blood through the lungs. The heart then becomes exhausted and stops in diastole. When air is injected into a carotid artery, there is a temporary anaemia of the medulla, but the collateral blood supply to the brain ensures that there is only an upset and not a complete arrest of the medullary functions.—J. A. NICHOLSON.

BENNETT, T. I. (1934). **The Causation and Treatment of Oedema.**—*Brit. med. J.* Nov. 24th. 929-934. 3 figs., 2 tables, 2 charts. [18 refs.]

Oedema is a physical sign indicating an excess of fluid in the tissue spaces. Its causation is one of those problems which have given rise to acute controversy in physiological and pathological circles. It is now generally agreed that two factors are chiefly responsible for the occurrence of oedema ; (a) changes in the intracapillary blood pressure and (b) lowering of the colloid osmotic pressure of the plasma proteins. Sodium chloride, though not a causal factor, is provocative of the condition in that it tends to hold water in the tissue spaces, but it is now considered that the sodium, and not the chloride ion, is responsible.

Various treatments of oedema are given, differing according to the cardiac or renal origin of the oedema, but the author makes it clear that no hard and fast rules for treatment can be given until a careful diagnosis has been made.

—JAMES STEWART.

COURTIN, A. (1933). Accidents para et pseudo vitulaires observés chez la vache. [**Milk Fever and Allied Diseases**].—*Thesis for Docteur vétérinaire, Alfort.* pp. 48. [17 refs.]

The author discusses several clinical cases of milk fever and allied disorders. Atypical cases responding slowly to calcium therapy and udder inflation were

associated with sudden climatic changes, and he considers that, in these, hypocalcaemia was not the only abnormality [hypomagnesaemia not considered]. As cause, he suggests autointoxication, invoking a similar explanation for " transit fever."—H. H. GREEN.

STOUSTRUP, P. (1934). Kaelvningsfeberens Aetiologi. **[The Cause of Milk Fever].**—*Medlemsbl. danske Dyrlaegeforen.* **17.** 107-112. 1 table.

The writer discounts the theory of KROGØE-PETERSEN [(1918). *Maanedsskr. Dyrlaeg.* **30.** 245.] that milk fever is caused by a fall in atmospheric pressure. Stoustrup has kept records for two years, during which time he has treated 94 cases and checked his own barometric readings with those of the local meteorological station. He finds that, of his 94 cases, only 15 occurred during or following a fall of the barometer. He believes that the weather and atmospheric pressures have no connection with milk fever, and appends a table of barometric readings for the same day and the two previous days, with a weather report for each date on which milk fever occurred.—A. A. FORSYTH.

MAXWELL, J. P. (1934). **Osteomalacia and Diet.**—*Nutr. Abstr. Rev.* **4.** 1-8. [33 refs.]

A useful account is given of the incidence of human osteomalacia in China and India. Deficiency of calcium and of vitamin D or sunlight are incriminated. In India, the custom of " purdah ", which keeps pregnant women indoors, can be blamed. Many cases are associated with a pregnancy anaemia. Osteomalacia and osteofibrosis in domestic animals are also dealt with, but less informatively.

—H. H. GREEN.

—. (1934). **Vitamin A and Nerve Lesions.**—*Brit. med. J.* Dec. 8th. 1053-1054. [2 refs.]

This article is a review of some of the recent work of MELLANBY and ABERLE. Deficiency of vitamin A in the diet gives rise to degeneration of the ganglion cells in the afferent nerves, ultimately leading to demyelination of the fibres and then to destruction of the axons. It is considered probable that many of the pathological conditions found in the respiratory, genito-urinary and alimentary tracts may be due to neurotrophic disturbances from afferent nerve degenerations caused by vitamin A deficiency. The early administration of butter or cod liver oil effects a cure.—HENRY DRYERRE.

TULLY, W. C., & FRANKE, K. W. (1934). **A Nutritional Disease Demonstrating a Feed Deficiency in Dried Eggs.**—*Poult. Sci.* **13.** 343-347. 2 figs., 1 table, 3 charts. [12 refs.]

Chicks fed on a ration in which the chief supply of animal protein was 15 per cent. of dried whole egg and 5 per cent. of dried buttermilk developed symptoms resembling pellagra. The chicks did not grow satisfactorily and at three weeks showed a scabby condition of the mouth and feet. The addition of 3 per cent. yeast foam tablet powder, or 5 per cent. yeast plus 3 per cent. of meat and bone scraps, did not prevent the trouble, showing that it was not due to vitamin B complex deficiency, but to some factor in the egg. Chicks fed on a ration in which the dried egg was replaced by meat and bone scraps did not develop the disease.

—R. F. GORDON.

PUBLIC HEALTH.

NIEBERLE, K. (1934). Die Tuberkulose und ihre Bedeutung für die Nahrungsmittelkunde. **[The Importance of Tuberculosis in Food Hygiene].**—*Z. Fleisch- u. Milchhyg.* **45.** 25-29.

The importance of tuberculous carcasses is discussed, and the query is raised as to whether the condemnation of a quarter containing macroscopic lesions of tuberculosis serves as an adequate protection of the consumer.—E. J. PULLINGER.

POSTMA, C. (1934). De toepassing der pH-bepaling bij onvoldoende uitgebloede varkens. **[The pH of Flesh of Badly-Bled Pigs].**—*Tijdschr. Diergeneesk.* **61.** 1182-1192. [Abst. from English, French and German summaries].

The author attempted to correlate the pH of meat from the fore and hind limbs of pigs with the condition of bleeding of the carcass. He considers that a pH of 6·6 and over, soon after slaughter, indicates insufficient bleeding.—J. E.

THERAPEUTICS.

WALLACE, J. M. (1934). **A Note on an Indirect Method of Demonstrating Drug Resistance in Trypanosomes** *in vivo.*—*Trans. R. Soc. trop. Med. Hyg.* **28.** 347-348. [1 ref.]

In order to be able to expose trypanosomes to a greater concentration of trypanocidal drugs *in vivo*, the author rendered test animals resistant to such drugs by administering them in increasing doses. Inoculation of the trypanosomes was carried out 24 hours after the animal had received the required dose of the drug. A strain of trypanosome, resistant to the drug under experiment, infected an animal treated in this way in five days, whilst a normal strain required ten days. —U. F. RICHARDSON.

GRANOUILLIT, F. (1934). Abcès de fixation et traitement chimique (Naganol, 309 Fourneau) dans le Surra des poneys en Cochinchine. Tentative d'explication de la genèse de la crise trypanolytique normale ou provoquée. **[Fixation Abscess and Chemotherapy (Naganol, 309 Fourneau) in Surra of Ponies in Cochin-China. A Possible Explanation of Normal or Induced Trypanolysis].**—*Rev. vét., Toulouse.* **86.** 327-331.

This article is a consideration of the role of leucocytes in surra-infected animals and their influence on the course of the disease. In an investigation made on ponies in Cochin-China, the author found that chemotherapy was most successful in those which responded best to an injection of turpentine beneath the skin, as shown in a consequent abundant pus formation. The suggested explanation is that in such animals leucocyte activity is greatest. He concludes, on these and other grounds, that the part played by leucocytes has an important bearing on the course of the disease and that drug treatment will be most promising in animals in which their activity is most marked. Anything, therefore, which increases the activity of leucocytes will favourably influence treatment. Turpentine injections have a double value in this connection, prognostic and therapeutic, in that they indicate the degree of leucocyte activity existing and also promote it. For the former purpose an injection should be made subcutaneously ; for the latter the author recommends the intravenous route.—C. DAVENPORT.

GOUSSEFF, W. F., & SOUDSILEWSKY, M. N. (1934). Zur Frage der Dauer der

Chemio-immunität, hervorgerufen durch Trypanblau bei der Pferdepiroplasmose (Piroplasma Caballi). [**The Duration of the Chemico-Immunity produced by Trypan Blue against Equine Piroplasmosis** – *Babesia caballi* **Infection**].—*Tierärztl. Rdsch.* **40.** 834-836. 2 tables.

This article records experiments carried out to ascertain the duration of the immunity conferred by the injection of trypan blue against equine piroplasmosis caused by *B. caballi*. Two animals failed to develop infection when inoculated with virulent blood 19 days and 45 days respectively after the injection of trypan blue, but contracted infections from a later second inoculation. Three horses failed to resist infection when inoculated with virulent blood 11, 18 and 29 days respectively after injection of trypan blue and, except that the incubation periods were longer than those of a control animal, there was no evidence of any protection against the disease, which ended fatally in two of the three animals.

—U. F. Richardson.

Mglej, S. (1934). Leczenie piroplazmozy u bydla todoritem. [**Treatment of Bovine Piroplasmosis with "Todorit"**].—*Przegl. wet.* **47.** 214-218. [21 refs.] [Abst. from German summary].

A favourable report on the value of "todorit" in the treatment of bovine piroplasmosis. The curative results are very prompt and even severe cases are curable [see also this *Bull.* **4.** 444].—J. E.

Miessner, H., & Köser, A. (1934). Therapeutische Versuche an künstlich mit Bruc. abortus infizierten Meerschweinchen. I. Chemotherapie. [**Experimental Chemotherapy of** *Br. abortus* **Infection in Guinea Pigs**].—*Dtsch. tierärztl. Wschr.* **42.** 593-595. 3 tables. [16 refs.]

Guinea pigs were infected with massive doses of *Br. abortus* and given, simultaneously or later, single doses of various drugs including "trypaflavine", "collargol", "naganol" and "sufrogel". No curative effect was observed.—J. E.

Oesterlin, M. (1934). Zur Chemotherapie der experimentellen Schistosomiasis. [**The Chemotherapy of Experimental Schistosomiasis**].—*Arch. Schiffs- u. Tropenhyg.* **38.** 433-441. 2 tables. [19 refs.]

Oesterlin has used white mice experimentally infected with *Schistosoma mansoni* as test animals for the efficiency of new anthelmintic drugs for the destruction of that parasite. He finds that fully grown mice serve this purpose very well, a dose of 200 to 250 cercariae being given. During the first few weeks of infection the parasites are found in the liver, but later they wander into the mesenteric vessels. Eggs are easily observed in the faeces, but are passed very irregularly and the number does not correspond to the extent of the infestation. Absence of eggs from the faeces for three successive days, however, can safely be regarded as evidence of the absence of infestation with adult male and female worms. Some 16 different substances were tested on *S. mansoni* in this experimental host and very good results were obtained with a new complex antimony compound known as "Sdt. 386 B". Subsequent trials on infected monkeys confirmed the good results obtained in mice.—E. L. Taylor.

Oesterlin, M. (1934). Zur Chemotherapie des Katzen-Leberegels (Opisthorchis felineus). [**Chemotherapy of Opisthorchiasis in Cats**].—*Arch. Schiffs- u. Tropenhyg.* **38.** 441-445. 1 table. [13 refs.]

An account is given of experiments with the complex arsenic-antimony compound "Sdt. 386 B" on opisthorchis infection in cats. Three experimental

animals were used, each of which received an infective dose of 550 cysts. The drug was administered by the intravenous route at the rate of 20 mg. per kg. body weight. No symptoms of intoxication were shown by the cats but the drug was observed to be very irritating to the tissues, necessitating careful administration of the injections. Eggs disappeared from the faeces of the three cats within 15 days, and a single injection was found to be as efficient as three injections at intervals of seven days.—E. L. TAYLOR.

MEYER, A. (1934). Versuche mit Tetra-Spezial zur Behandlung der Parasiteninvasion bei Pferden. [**Trials with " Tetraspezial " as an Anthelmintic for Horses**].—*Tierärztl. Rdsch.* **40.** 431-433. 1 table. [17 refs.]

The active principal of " tetraspezial " is carbon tetrachloride, which is mixed with some substance that facilitates its emulsification with water. An emulsion made of 100 g. of " tetraspezial " with 600 c.c. of water was given by stomach tube, in various quantities, to 20 horses. It was found that, in this form, a horse could withstand as much as 0·33 g. of carbon tetrachloride per kg. body weight without there being any more serious untoward effect than a temporary loss of appetite. The anthelmintic effect was good.—E. L. TAYLOR.

SCHÄTZL, J. (1934). Verminekrin als Anthelminthikum beim Hund. [**" Verminekrin " as an Anthelmintic in the Dog**].—*Münch. tierärztl. Wschr.* **85.** 317-318.

Schätzl reports the results of his trials with a new proprietary anthelmintic – " verminekrin " – which, according to the makers, has as its active ingredients arecolin as an anthelmintic and methylene blue as an intestinal disinfectant.

The anthelmintic effect shown in the 52 test infestations in dogs is clearly that of arecolin, comparatively little effect being observed on ascarids, but considerable effect on tapeworms, the complete worm, including scolex, being expelled in most instances. It was observed, however, that some ascarids were also expelled in cases where they were present along with tapeworms.—E. L. TAYLOR.

WRIGHT, W. H., & UNDERWOOD, P. C. (1934). **Fouadin in the Treatment of Infestations with the Dog Heart Worm,** *Dirofilaria immitis.*—*Vet. Med.* **29.** 234-246. 4 figs., 3 tables. [16 refs.]

This investigation was initiated on account of the rapid spread of heart-worm infestation, during recent years, from the southern states of America northwards along the Atlantic seaboard. " Fouadin " had previously been used by POPESCU with good results and, in the present work, the authors have endeavoured to investigate further the efficiency of this drug. The course of treatment, administering the drug either intramuscularly or intravenously, must be carried out with caution as, where the infestation is a heavy one and many worms are killed within a short space of time, there is some danger to the life of the host. A suitable course of treatment results, however, in the permanent disappearance of microfilariae from the peripheral circulation, in the sterilization of the female worms and, eventually, in the destruction of some or all of the adult worms in the heart and pulmonary artery. These are carried by the blood stream into various branches of the pulmonary artery and became encapsulated in the parenchyma of the lung, where they are eventually absorbed. The action of " fouadin " is cumulative and exerted over a relatively long period and may cause considerable injury to liver and kidneys. Adequate repair was found to have taken place, however, in most dogs killed at periods of 38 days or longer after the termination of treatment. The intravenous route is recommended for the administration of the drug, as it

permits of the use of smaller doses and exerts its anthelmintic effect more speedily. The dose rate must be calculated very carefully, and gradually increased as the course of treatment is carried out, working up, by degrees, from 0·5 c.c. or 2·5 c.c., according to the weight of the dog, to 1·5 c.c. or 5 c.c.—E. L. TAYLOR.

REBRASSIER, R. E. (1934). **Pyrethrum as an Anthelmintic for Ascaridia lineata.** —*J. Amer. vet. med. Ass.* **84.** 645-648. 1 table. [4 refs.]

The anthelmintic effect of pyrethrum powder was tried on 30 chickens infected with *A. lineata*. The powder was found to contain 0·8 per cent. of pyrethrine and it was given in gelatine capsules in doses of 200 mg. per bird. All faeces were collected for a period of 72 hours after the dose had been administered and examined for expelled worms. The chickens were then killed and a *post-mortem* examination carried out for the recovery of any worms which had been left behind. Results show that a total of 333 worms was removed from the 30 chickens and only 17 were left behind, representing an average efficiency of 95·14 per cent. In only six instances out of the 30 did the efficiency fall below 100 per cent.

—E. L. TAYLOR.

DANCKWORTT, P. W., BUDDE, H., & BAUMGARTEN, G. (1934). Die Wertbestimmung von Derriswurzeln. [**Standardization of Derris Root**].—*Arch. Pharm. Berl.* **272.** 561-569. 3 tables. [14 refs.]

The chief tests for the rotenone content of derris root have been based on estimation by weight after chemical extraction ; four such methods are described.

The authors tested the polarization method, using benzol as a solvent for rotenone. They found it to be laevorotatory, the degree varying directly with the concentration ; the method is, therefore, suitable for quantitative assay. The rotenone percentage figures for several samples of derris of different origin are given ; they varied between 9·4 and 3·8 and were somewhat higher than those obtained by the carbon tetrachloride and chloroform extraction methods. The latter were unreliable with rotenone contents of less than 4 per cent., whilst the polarization method was equally reliable below that figure.

A new colour test is also described : if a chloroform extract of derris root is filtered and concentrated sulphuric acid is added to a few drops of the filtrate on a watch glass, the rotenone is dissolved in the acid, producing an orange-yellow colour, which turns to reddish-violet on the addition of a few crystals of sodium nitrite. The greater the rotenone content, the more intense is the change from yellow to violet. This test is particularly useful for showing the absence of rotenone from the test material, but is of less value as a quantitative test.

The rough test of a good quality derris wash – its frothy-milky character on being shaken up – is also mentioned.—J. E.

HAMBROCK, H. A., & WILKEN-JORDEN, T. J. (1934). **Researches into Dips and Dipping. D. Effects of Dips on Wool. Paper I. The Effects of Arsenical Dips on Wool.**—*Onderstepoort J. vet. Sci.* **2.** 271-298. 3 figs., 20 tables, 4 graphs. [21 refs.] [For abst. of previous articles of this series see this *Bull.* **3.** 735].

The influence of Cooper's powder dip and sodium arsenite on the fleece was examined. Arsenic remains in the fleece even after scouring. The dips themselves did not appear to harm the fleece, but Cooper's preparation may cause yellow staining. The effect of the ultra-violet radiations of ordinary sunlight on the fleeces of dipped sheep is discussed.—E. M. ROBINSON.

HAMBROCK, H. A., WILKEN-JORDEN, T. J., & GRAF, H. (1934). **Researches into Dips and Dipping. A. Lime-Sulphur Dips. VI. A Survey of the Behaviour of Lime-Sulphur Dips under Field Conditions.**—*Onderstepoort J. vet. Sci.* **2.** 243-266. 19 tables. [8 refs.]

The results of analyses of lime sulphur dip washes from various parts of the Union are summarized and discussed. The samples were all taken from actual dippings during the scab campaign. Factors influencing the composition of lime sulphur dips, and the effects of processes involved in the actual dipping are discussed. The average normal field efficiency of the dips was found to lie around 70 per cent. The average amount of dip removed by each animal was 0·59 gall.
—E. M. ROBINSON.

STEYN, D. G. (1934). **The Effect of Sulphur on Merino Sheep and a Further Experiment to Determine the Safe Dose of Sulphur for Cattle.**—*J. S. Afr. vet. med. Ass.* **5.** 18-22. 1 table. [4 refs.]

In a previous experiment [this *Bull.* **3.** 571.] Steyn showed that there was an indication that 5 g. of sulphur given once, three or six times weekly over prolonged periods caused an increase in body weight and wool yield. SEDDON, using larger doses of sulphur, did not have such favourable results and PIERCE, with smaller doses, did not notice any increase in weight or wool production. Steyn considers that the improvement noticed by him was due to the tonic effect of the sulphur and its stimulation of skin activity. It was found that dosing with 30 g. of sulphur daily had no harmful effects on cattle.—E. M. ROBINSON.

WEISCHER, & SONDERKAMP. (1934). Erfahrungen mit der Kalzium-Therapie bei akuten Erkrankungen unter besonderer Berücksichtung der Komplikationen und des Indikationsgebietes. [**Experience with Calcium Therapy in Acute Conditions**].—*Tierärztl. Rdsch.* **40.** 109-113. 1 table.

The authors recommend the following dosage with calcium gluconate. A 5 per cent. solution, which has been boiled, is administered intravenously in a dose calculated on a basis of 6 g. of calcium preparation per cwt. live weight. For pigs, the dose must be given subcutaneously. Under certain circumstances, which are detailed in every case, calcium therapy may be of value in tetanus, lactation and pregnancy intoxications, prostration, lumbago, purpura haemorrhagica, urticaria and certain allergic diseases.—E. J. PULLINGER.

LAAS, A. (1934). Beiträge zur Behandlung des Morbus maculosus equorum mit Calcium und Jod. [**Treatment of Purpura Haemorrhagica in Horses with Calcium and Iodine**].—*Arch. wiss. prakt. Tierheilk.* **67.** 335-339. [17 refs.]

The majority of authors are now in agreement that purpura haemorrhagica is an anaphylactic state, caused by the absorption into the system of substances produced as the result of streptococcal infection. Assuming that this is correct, Laas has developed a line of treatment which is described in detail and which proved very effective in 26 out of 27 cases.

150 to 200 c.c. of a 7·5 per cent. sterile calcium Sandoz solution is given intravenously. 20 g. of calcium chloride and a teaspoonful of Lugol's solution are given daily or every other day in the drinking water. A local dressing, consisting of turpentine and spirits of camphor, is applied to the swellings and plenty of food, air and space is recommended. In less than three weeks recovery occurred in more than half the cases treated.—N. S. BARRON.

REINHARDT, W. (1933). Klinische u. pharmakologische Untersuchungen über

ein neues, " reizstoffreies " Aloepräparat. **[Trials with a New Non-irritant Aloes Preparation, "RF"].**—*Inaug. Diss. Hanover.* pp. 48. 13 figs. [38 refs.]

The preparation of extractum aloes (" RF ") from *Aloe capensis* is described. In common with certain other vegetable laxatives, emodin is its active principal. To test its efficacy, the intestines of a series of dogs were exposed by operation and divided into compartments by ligature. The new preparation was injected into one section and the commonly used extractum aloes into another section for purposes of comparison.

Unlike the official preparation, a good laxative effect was produced without the development of a local inflammation of the mucous membrane. Peristalsis was stimulated. When given in pill form to a series of dogs the results proved satisfactory, though large doses fed to guinea pigs had no effect.—N. S. Barron.

Steinach, E., Stäheli, A., & Grüter, F. (1934). Behebung der Sterilität bei landwirtschaftlichen Nutztieren (Rinder, Kühe, Schweine) durch das weibliche Sexualhormon. **[Hormonal Treatment of Sterility in Cattle and Pigs].**—*Wien. klin. Wschr.* **47.** 129-132. 1 table. [13 refs.]

Sexual indifference in domestic animals may be treated by subcutaneous injections of progynon benzoate, a tissue extract, containing sex hormone. Sixty-six cows, which failed to come on heat during periods ranging from four to eight months, were treated with single injections of this preparation. Of these, 61 came on heat within three days of treatment. Equally successful results were obtained with a very small group of pigs. The doses given were 50,000 mouse units to cows and 25,000 to pigs.

Amongst animals so treated, about 50 per cent. became pregnant following service. This compares very favourably with the normal percentage of pregnancies in healthy herds.—E. J. Pullinger.

Dubois, C. (1934). L'extrait de lobe postérieur d'hypophyse. Ses applications en médecine vétérinaire et particulièrement en obstétrique. **[Use of Posterior Pituitary Extract in Veterinary Medicine].**—*Bull. Acad. vét. Fr.* **7.** 237-239.

This is an account of the use of posterior pituitary extract in 17 cases of delayed parturition in domestic animals. The extract is a valuable ecbolic.—J. E.

POISONS AND POISONING.

Fairley, A., Linton, E. C., & Wild, F. E. (1934). **The Absorption of Hydrocyanic Acid Vapour through the Skin. With Notes on Other Matters relating to Acute Cyanide Poisoning.**—*J. Hyg., Camb.* **34.** 283-294. 2 figs., 2 tables, 20 charts. [13 refs.]

It was shown that an atmosphere saturated with HCN is readily absorbed by a skin surface amounting to 1/60th of the body area in the guinea pig and that death results if the exposure is prolonged. As long as there was free facility for evaporation, death could not be brought about from spilling the liquid HCN on the bare skin, owing to the great volatility of HCN. Intravenous injection of sodium thiosulphate was shown to afford a slight degree of protection against skin absorption of HCN. A most important finding by the authors was that acute poisoning by HCN did not appear to produce any *post-mortem* appearances, either macroscopic or microscopic, which were characteristic or from which a diagnosis could be made.—James Stewart.

STOCKMAN, R. (1934). **The Chemistry and Pharmacology of Lathyrus Peas.**—*J. Hyg., Camb.* **34.** 145-153. [19 refs.]

Feeding large quantities of lathyrus peas causes degeneration of the nerve cells and nerve fibres of the cerebrospinal and sympathetic nervous system. It has been established that the toxic action of lathyrus peas is due to the salts of phytic acid and their breakdown products. The author used a watery extract of lathyrus peas and various salts, all organic and inorganic phosphates, which he isolated from the extract. All were found to exert a marked action on the brain and spinal cord. When given intravenously they were extremely poisonous, very much less so if given hypodermically, and enormously less so when administered *per os*. It is suggested that, when given *per os*, the toxic organic phytates were converted in the bowel into much less toxic inorganic phosphates, but that if they escaped decomposition, they were absorbed and caused acute or chronic lathyrus poisoning.

The above may have a wide and general bearing, as similar bodies are obtainable from all cereal and leguminous seeds.—JAMES STEWART.

I. TOMB, J. W., & HELMY, M. M. (1933). **The Toxicity of Carbon Tetrachloride and its Allied Halogen Compounds.**—*J. trop. Med. (Hyg.).* **36.** 265-270 and 334-339. 2 tables, 1 map. [9 refs.]

II. MAPLESTONE, P. A., & CHOPRA, R. N. (1933). **The Toxicity of Tetrachlorethylene to Cats.**—*Indian med. Gaz.* **68.** 554-556. [4 refs.]

I. The authors give an account of the chemistry of the anthelmintic drugs allied to carbon tetrachloride and summarize present knowledge on the mechanism of the intoxication. The second part of their paper deals more particularly with an analysis of cases of carbon tetrachloride poisoning in human beings, which leads to the following conclusions :– that fatalities are much more common among children than adults – probably due to insufficiency of calcium reserve ; that immediate poisoning is generally associated with disease of the liver, and that delayed poisoning is due to non-elimination of the drug from the intestine. In Egypt, fatal intoxication has been found to be closely associated with ascariasis, which either causes mechanical obstruction to the action of the saline purgative or diminishes natural resistance to the drug.

II. Experiments previously carried out by the author and CHANDLER (1925) have shown the marked toxicity of carbon tetrachloride for cats in Calcutta. Forty-five out of 49 cats were killed by doses of 0·5 c.c. and 24 out of 27 cats by doses of 0·25 c.c. It therefore seemed unsafe for use on human beings, and experiments were carried out to ascertain whether tetrachlorethylene might be safer. A dose of 5 c.c. per kg. body weight was found to be fatal but 1 c.c. per kg. body weight was quite safe and, although slight restlessness and drowsiness was sometimes exhibited, no evidence was found of any injury to internal organs from such a dose.—E. L. TAYLOR.

VIANELLO, G. (1934). L'intossicamento dei suini da olio di fegato di merluzzo alterato e la distrofia tossica del fegato. **[Cod Liver Oil Poisoning in Swine].** —*Clin. vet., Milano.* **57.** 505-521. 12 figs. on 4 plates. [11 refs.]

Cod liver oil for administration to animals is more or less turbid, brownish-red in colour and has a distinctly fishy smell. It should contain 60 rat units of vitamin B and five to eight units of vitamin A per g. On fermentation of the oil, undesirable fatty acids, their breakdown products and ptomaines are formed. On ingestion, these substances are carried directly to the liver, where they exert a toxic effect on the hepatic cells.

A batch of about 100 pigs was given a liberal supply of cod liver oil to assist recovery from a mild chronic broncho-pneumonia. After 10 to 15 days, 34 pigs became ill and 12 died. On *post-mortem* examination, a diffuse catarrhal enteritis was found, the liver was variegated in colour and covered with greyish-yellow irregular nodules. Bacteriological examination yielded negative results and inorganic poisons could not be detected. Histological examination showed various stages of fatty degeneration of the liver cells. Analysis of the cod liver oil showed that it was of extremely bad quality and fatty acids were present in large numbers. On withdrawing the oil from the diet, the affected animals recovered.

—J. A. Nicholson.

PHYSIOLOGY.

Egehøj, J. (1933). Fortsatte Undersøgelser over Lymfefordelingen hos Kvaeg. [**Investigations into the Lymphatic System of the Subcutaneous Tissues of Cattle**].—*Maanedsskr. Dyrlaeg.* **45.** 369-382. [3 refs.] [A German translation appeared in *Dtsch. tierärztl. Wschr.* (1934). **42.** 109-111 and 141-143].

A total of 145 hypodermic injections of pyrrol blue were made in 53 bovines. The injections were distributed over different parts of the body, and from one to nine were made in each part. By this method some new information on the distribution of the subcutaneous lymphatics was obtained and this is described.

—H. C. Bendixen (Copenhagen).

Sandberg, I. (1934). Ueber die Lymphdrüsengebiete beim Rinde. Bericht über einige neuere nordische Untersuchungen. [**The Lymphatic System of the Ox**].—*Z. Fleisch- u. Milchhyg.* **45.** 1-2. [5 refs.]

This is a very short communication giving details of the results of an investigation on the lymphatic system of the cow, carried out in Copenhagen by other workers. It is very rightly pointed out that a correct and sound knowledge of the lymphatic drainage is of fundamental importance for pathologists who are investigating the pathogenesis of disease. The author mentions, as an example in which it is necessary to have a clear idea of the lymphatic system, the metastatic spread of tumours by way of the lymphatics. More important still, from the point of view of the veterinarian, is the problem of tuberculosis. The methods utilized by the investigator are briefly mentioned. It appears from the results cited that, contrary to the usual belief, the intercostal and axillary lymph glands, as well as the superficial cervical gland, play a part in the drainage of the subcutaneous tissues of the shoulder and withers.—J. R. M. Innes.

Warnecke, K. (1933). Zur Sekretion der Glandula mandibularis der Ziege. [**Secretion of the Mandibular (Salivary) Gland in Goats**].—*Inaug. Diss. Hanover.* pp. 39. 1 fig., 19 tables. [3 refs.]

By means of a permanent fistula in Wharton's duct, the author has collected the saliva from the submaxillary glands of two goats. It appears that the gland does not secrete continuously but is activated by special stimuli. Thus, the presence of dry food, e.g. hay, in the mouth produces a strong secretion, whereas water produces no secretion and, on drinking milk, only a small amount of saliva is produced. The gland may be induced to secrete both by chemical and mechanical stimulation of the mucous membrane surrounding the orifice of the duct, and also centrally by the injection of pilocarpine. Showing the animal food after a period of hunger only produces a scanty secretion of saliva. At the beginning of secretion

the saliva is turbid, rich in dry matter and has a high nitrogen content ; as the secretion continues, the saliva becomes clearer and the nitrogen content falls. The saliva is alkaline and contains no ptyalin.—J. A. NICHOLSON.

LENKEIT, W., & COLUMBUS, A. (1934). Zur Prüfung des Schlundrinnenreflexes. Beitrag zur Physiologie des Schlundrinnenreflexes. **[The Testing of the Oesophageal Groove Reflex]**.—*Arch. wiss. prakt. Tierheilk.* **68.** 126-133. 2 tables, 4 charts. [10 refs.]

The authors describe a new technique and give the results of their work, extending over one year, on a number of small ruminants.

Straw is stained with fuchsin and cut up into minute pieces (2 × 0·5 mm.), automatically counted and mixed with the food or water, etc., to be given as a drench or by stomach tube ; a straw fragment count is made from the faeces at 12-hourly intervals after dosing, for five days. The percentage of the total dose of straw recovered at each test count is then plotted on a graph, which gives a clear idea of the rate of excretion ; from this, the action or inaction of the oesophageal groove can be roughly determined.

In a few cases, water was used as a vehicle for the straw, and milk (voluntarily drunk or administered by stomach tube), with or without oatmeal, in many cases. In lambs five to 15 weeks old so treated, the straw began to appear by, or before, the 12th hour, and the maximum straw count was obtained at the end of the first, or early in the second, 24-hour period. The development of the maximum count took about 12 hours longer in full grown animals (end of second day).

Sodium chloride and sodium carbonate (both 1 per cent.) did not exercise any appreciable opening action on the oesophageal groove of adult sheep, but a state of thirst (no water for two days) appeared to have such an action.—J. E.

ZIMMERMANN, A. (1934). Zur vergleichenden Anatomie der extrahepatischen Gallenwege. **[The Comparative Anatomy of the Extra-Hepatic Bile Ducts]**. —*Arch. wiss. prakt. Tierheilk.* **68.** 112-125. 4 figs. [22 refs.]

Three different groups of animals can be distinguished by a consideration of the anatomical position of the openings of the common bile duct and pancreatic duct into the duodenum. In the first group the two openings are separate (cattle, swine, rabbits and guinea pigs) ; in the second group the two ducts either open separately, but close together, into a common ampulla – diverticulum vateri – (human beings and horses) or the ducts open close together on to a common blunt papilla – papilla duodeni – (dogs and cats), and in the third group the pancreatic duct opens into the bile duct before the latter enters the duodenum (sheep, goats, deer and rats). The ducts can also be classified by their relation to the gall-bladder.

A careful and detailed description of the size, capacity and histological structure of the various ducts and gall-bladder is given. In those animals without a gall-bladder (horses and rats) the common duct is richer in glands and is wider.

The comparative rarity of gall-stones in animals is noted, although the similar three types which occur in human beings (cholesterin, pigment and calcareous) have been recorded. A brief comment is made on the mechanism of emptying, and the function of the gall-bladder.—J. R. M. INNES.

FELL, Honor B., & ROBISON, R. (1934). **The Development of the Calcifying Mechanism in Avian Cartilage and Osteoid Tissue.**—*Bio-chem. J.* **28.** 2243-2253. 18 figs. on 3 plates, 2 tables. [9 refs.]

The authors give some results of experiments in connection with the important

problem of ossification, investigations into this subject having engaged the attention of workers at the Strangeways Laboratory, Cambridge, for some years. In the developing bone of the child, rat or rabbit, hypertrophy of the cartilage cells at the growing end of long bones is rapidly followed by deposition of calcium salts in the cartilage matrix.

The uncalcified areas in hypertrophic cartilage of rachitic bones can be calcified by immersing slices of the bones *in vitro* in a solution containing the necessary salts. It thus appears that the calcifying mechanism is closely connected with hypertrophy of the cells.

Fowl bones were cultivated *in vitro* to show the influence of solutions containing calcium and organic and inorganic phosphate, the purpose being to discover how far the development of the calcifying mechanism preceded calcification of the osteoid tissue and cartilage of the embryonic fowl. In fowls the cartilage of the long bones hypertrophies early in embryonic life, but calcification only begins about the 15th day of incubation and proceeds slowly. The early cartilage, although containing phosphatase, cannot be calcified. The results agreed with the view that a specialized mechanism is developed in hypertrophic cartilage and osteoid tissue before these can be calcified in the body. They also support the conclusion that phosphatase is an important component of the mechanism, but is not the sole factor concerned.
—J. R. M. Innes.

Danckwortt, P. W., & Höll, K. (1934). Chemische Untersuchungen über das normale Vorkommen von Blei in Organen und Knochen gesunder Haustiere. [**The Occurrence of Lead in the Organs and Bones of Healthy Animals**].—*Dtsch. tierärztl. Wschr.* **42.** 586-589. 4 tables. [7 refs.]

A detailed account is given of the technique adopted for the preparation of the material for analysis and of the analytical methods used. Lead was estimated qualitatively by the triple-nitrite reaction and quantitatively by a volumetric method, whereby the lead chromate was titrated against standard sodium thiosulphate, and also by an electrolytic method. The samples for analysis consisted of liver, spleen, kidneys and brains, or mixed samples of these organs. The mean value for 36 samples of the organs of cows was 0·051 mg. Pb. per 200 g. of material (ranging from 0·02 to 0·2 mg.), and for 11 samples from pigs the mean was 0·33 mg. Pb. per 200 g. of material (ranging from 0·05 to 1·05 mg.), whilst five samples from horses were of the same order as those from cows. For the bones of cows the mean value of nine samples was 0·66 mg. Pb. per 200 g. of material (ranging from 0·05 to 2·3 mg.), whilst from pigs two samples gave 1·3 mg. Pb. and 1 mg. Pb. per 200 g. of bones. It is of special interest to point out that in many cases the qualitative test was negative despite a value of up to 0·07 mg. Pb. per 200 g. of material being obtained by the electrolytic method.—James Stewart.

Neseni, R. (1934). Ueber das Vorkommen von Verdauungsfermenten bei Föten. [**Occurrence of Digestive Ferments in Foetuses**].—*Dtsch. tierärztl. Wschr.* **42.** 214-216. 3 tables. [10 refs.]

Certain tissues of the foetuses of cattle, sheep and swine have been examined at different stages of development in order to ascertain at what stage various enzymes appear in the tissue. The appearance of amylase, pepsin, chymosin, trypsin and erepsin has been followed in the liver, stomach, pancreas, intestines and salivary glands. The enzymes do not appear in all the tissues at the same time ; thus, in the foetus of cattle, amylase appears at three, four and five months in the liver, salivary glands and pancreas respectively. The figures are given for all the tissues mentioned.—W. R. Wooldridge.

LEHNERT, E. (1934). Bestämning av de röda blodkropparnas antal med blodkroppsvolymens hjälp. [**Red Blood Corpuscles Count by Volume Percentage Estimation**].—*Skand. VetTidskr.* **24.** 215-226. 1 fig., 3 tables. [6 refs.] [English summary : abst. from orig.]

Blood counts for erythrocytes take a considerable time, and estimation by volume percentage of slowly sedimented blood gives too great a margin of error.

The author describes a method by which the volume percentage of erythrocytes is estimated, after centrifuging at 3,000 R.P.M. for half an hour. He uses tubes 12 cm. long with a rectangular lumen, graduated in 0·1 c.c. The volume per cent. of erythrocytes is divided by four, which gives approximately the number in millions per c.mm. He has checked his results in 53 cases by counts in a Bürker's chamber.

There are several sources of error, such as alterations in the plasma and variations in size of the erythrocytes which, in horse blood, are sometimes considerable. The method takes little time and may be of value as an aid to diagnosis.

—A. A. FORSYTH.

I. SIMPSON, R. H. (1933). **Physiological Leucocyte Counts and the Detection of Small Deviations from the Normal.**—*Brit. J. Radiol.* **6.** 705-721. 4 tables, 8 graphs. [7 refs.]

II. HARVEY, W. F., & HAMILTON, T. D. (1934). **Constancy of the Day-to-Day Leucocyte Blood Count. (A Medico-Statistical Study).**—*Edinb. med. J.* **41.** 465-496. 9 figs., 2 tables. [20 refs.]

III. —. (1934). **Variations in the Normal Blood Count.**—*Brit. med. J.* Nov. 10th. 867-868. [4 refs.]

I. This article records work directed towards the elucidation of certain problems connected with fluctuations in the leucocyte count in workers in radiology, viz., the more accurate demarcation of the range of normal, the detection of minor alterations and investigation of such alterations. An extensive series of total and differential counts made on healthy subjects under a variety of conditions gave the following results :—(1) the normal count fluctuates within wide limits and overlaps at both ends figures which may be pathological in some cases, and (2) it is not possible to establish any but gross variations, pathological in origin.

II. This is an elaborate analysis in graphic presentation of 100 leucocyte counts made on two individuals and compiled from the results of blood film examination. The series from the normal of these two varied only within narrow limits. The authors consider that, provided films are well made, the information so obtained is reliable. They further consider that even a single differential leucocyte count furnishes a valuable index of body condition.

III. This is a brief summary and commentary on both the above articles.

—C. DAVENPORT.

LAGRANGE-FRANCÈS. (1934). Considérations sur l'influence du passage dans le lait de quelques principes d'origine minérale ou végétale. [**Effect on the Milk of the Ingestion of Certain Plants and Minerals**].—*Le Lait.* **14.** 811-817. [1 ref.]

A list is given of plants which either give a colour or taste to the milk, or assist or hinder coagulation. The author has been able to confirm that many of these plants possess such properties. The effect of the administration of cod liver oil to cows is next considered. After 15 days, analyses of the milk showed that the fat content was increased. Butter made from such milk possessed a distinctly

higher colour than before the administration of cod liver oil; this was confirmed by colorimetric examinations. It has been suggested that the colour is due to an increased liberation of vitamin A in the milk. The effect of vitamin A on milk was studied by giving two cows up to 3 kg. of red carrots daily for 15 days. Although the total milk yield was slightly reduced, the fat content increased and a change in colour was noted in the butter. This milk proved highly beneficial when given to infants.—J. A. NICHOLSON.

ACKERKNECHT, E. (1934). Ueber Drüsen. [**Glands. An Anatomical Lecture**]. —*Berl. tierärztl. Wschr.* **50.** 673-677. 4 figs. [3 refs.]

This is a general statement regarding the classification of glands, based partly on their histological structure and partly on their function and type of secretion. —J. R. M. INNES.

HARVEY, F. T. (1934). **Acetylcholine: a Peristaltic Hormone.**—*Vet. Rec.* **14.** 1219-1221.

The study of choline and its derivative acetylcholine has shown that the latter is essential for intestinal peristalsis, and it is probable that post-ganglionic parasympathetic nerve fibres act only on the local liberation of acetylcholine. These facts have suggested to the author that hypodermic injections of acetylcholine would be the correct treatment in spastic conditions of the bowel in horses, since the use of arecoline or eserine is often contra-indicated as they depress the heart. In six cases of colic in horses, 15 grains of acetylcholine administered hypodermically produced marked action of the bowels in 15 to 20 minutes. In one case, where larger doses of acetylcholine were given, there was a rush of fluid through the nostrils and other alarming symptoms. These passed off, but laminitis supervened later. Whilst the number of cases treated are too small to draw any definite conclusions, yet the results are encouraging and it would appear that repeated small doses (7·5 grains) of acetylcholine are indicated in certain cases of colic in horses.—J. A. NICHOLSON.

TRAUTMANN, A. (1934). Zur Frage der physiologischen Involution der Epiphysis cerebri. [**Physiological Involution of the Epiphysis Cerebri**].—*Dtsch. tierärztl. Wschr.* **42.** 599-602. 5 figs.

The author has examined histologically pineal glands obtained from a number of cattle of all ages. Both in calves and in older animals the gland may be divided into three zones, the sizes of which vary in animals of different ages. In the basal zone, the pineal cells occur singly or in small groups scattered through the substance of the gland. In the middle zone, the parenchyma cells are arranged in groups which are separated by glial cells. In calves, this characteristic structure is more pronounced than in older animals. In the apical zone, the pineal cells lie close together; there is a pronounced lobular grouping of the cells in calves whereas, in older animals, the cells are in uniform layers. Glands from old animals often, but not invariably, show evidence of calcium deposition in the apical and middle zones. There may also be an increase in the amount of connective tissue, with a corresponding decrease in parenchymatous tissue. The glial tissue generally decreases as the animal gets older and, occasionally, cystic degeneration of the glial nests is seen. These changes have suggested that the pineal gland undergoes involution but, in the author's opinion, they do not indicate that the gland ceases to function, although its effect may be different from that which it exercises in the immature animal.—J. A. NICHOLSON.

DODDS, E. C. (1934). **Oestrus-Producing Hormones.**—*Brit. med. J.* Dec. 29th. 1187-1189. 1 fig. [9 refs.]

This paper gives a general outline of present knowledge of the nature and chemistry of oestrum-producing hormones and of experimental work relating to them. Ketohydroxy- and trihydroxy-oestrin can be obtained from the urine of pregnancy, the potent dihydro-folliculin by chemical procedure, and an unknown type of oestrin is present in either blood, ovary or placenta. Similar substances occur in plants and mineral fuel oils. All female animals are said to respond to injection of these hormones given in suitable doses.

KAUFMANN'S experiments on inducing menstruation in ovariectomized women have been confirmed by the author, demonstrating that these hormones are of definite therapeutic value.—A. L. MULLEN.

DODDS, E. C. (1934). **The Practical Outcome of Recent Research on Hormones.** —*Lancet.* **227.** 1318-1320. 1 fig., 1 table.

This paper opens with a brief historical summary of the discoveries made regarding the functions of the thyroid, the pancreas and the adrenal glands, together with the isolation of their respective hormones. This is followed by a more detailed discussion of the sex hormones, their isolation, chemical constitution and clinical application. The most prolific source of oestrin is the urine of pregnant mares. Chemically, it belongs to the sterols and, by hydrogenation, its potency has been increased five-fold. The dose is proportional to the body weight, a human subject requiring about 500,000 mouse units. It has been shown that the administration of oestrin to ovariectomized animals will produce oestrum, and that this condition is more readily obtained when the oestrin administration is followed by a course of injections of extract of corpus luteum.—HENRY DRYERRE.

HAMMOND, J. (1934). **Fertility in Poultry.**—*18th Rep. Poult. Conf. Harper Adams Agric. Coll.* pp. 487-496. 15 figs. [7 refs.]

The fertility in poultry is controlled at three main stages :- (1) the number of eggs laid by the hen ; (2) the number of eggs fertilized and (3) the number of fertilized eggs which develop normally.

(1) The seasonal fluctuation in egg production closely follows the length-of-daylight curve, and an increase in the light ration will keep up the egg production in the winter months. It is the author's opinion that light acts by stimulating the anterior pituitary gland to increased secretion, and this in turn stimulates the ovary to increased production. Breeding stock should be judged for their production during the winter months, when the natural level of anterior pituitary secretion is low.

(2) This depends largely on the number and vitality of the sperms produced by the cock, and on the time between mating and laying. The maximum number of fertile eggs are laid about the fifth to seventh days after mating and a drop in fertility occurs about six days after removal of the cock from the pen. The sperm production is also influenced by the anterior pituitary gland secretion, and experiments with starlings show that an increase in the light ration will stimulate the development of the testes.

(3) This is divided into (a) external factors, i.e., incubation environment and (b) internal factors, i.e., the quality of the egg.

(a) The longer the egg is kept before incubation the lower the percentage hatchability. Inequality of temperature and humidity lowers the vitality of the embryo.

(b) Abnormalities of development are hereditary characters usually of a

recessive nature, and may be hidden in the strain until two birds with the same hidden defect are mated. Thus inbreeding may often give rise to a large proportion of eggs which do not hatch or which result in weak embryos.—R. F. GORDON.

SCHLOTTHAUER, C. F., MANN, F. C., & ESSEX, H. E. (1934). **A Study of Egg-Production, Fertility and Hatchability of a Flock of Turkeys with Cecums Occluded.**—*J. Amer. vet. med. Ass.* **85.** 455-457. [2 refs.]

In a previous investigation the authors corroborated the work in regard to the protection of turkeys from enterohepatitis by occlusion of the caeca. In this experiment the eggs were collected and incubated from a flock of turkeys in which the caeca had been ligated. The results were much better than those obtained with a control flock of birds which had not been operated upon, and which was maintained on ground that was not contaminated. From the data it would appear that ligation of the caeca does not affect egg production, fertility, or hatchability and that the loss of whatever function the caeca may possess does not seem to be injurious to the breeding flock.—R. F. GORDON.

BLOM, I. J. B. (1934). **Studies in Mineral Metabolism. XXX. Variation in the Iodine Content of Grasses at Different Stages of Growth and a Note on the Iodine Content of Milk.**—*Onderstepoort. J. vet. Sci.* **2.** 139-150. 3 figs., 11 tables. [7 refs.] [For abst. of previous articles of this series, see this *Bull.* **4.** 131].

Portions of various experimental grass plots at Onderstepoort were cut at monthly intervals and iodine determinations were made. A distinct seasonal variation was noticed, the maximum iodine content occurring at about the eighth to ninth month of growth. The author notes the high amount of iodine in the milk of a cow receiving this grass in the ration and in that of a cow whose uterus was being douched with Lugol's iodine.—E. M. ROBINSON.

DU TOIT, P. J., MALAN, A. I., & GROENEWALD, J. W. (1934). **Studies in Mineral Metabolism. XXXI. Minimum Mineral Requirements of Cattle (2nd Report).**—*Onderstepoort J. vet. Sci.* **2.** 565-606. 2 figs., 6 tables, 12 charts. [11 refs.] [For abst. of previous articles of this series, see this *Bull.* **4.** 68].

This article summarizes the results of experimental work carried out over a period of two and a half years, each animal passing through two gestation and two lactation periods. As regards daily requirements of different minerals, it was found that 14 g. chlorine, 15 g. Na_2O and 0·38 g. of K_2O were sufficient for the production of 2 gall. of milk per day for 90 days. Clinical symptoms of calcium deficiency could not be produced, though they could easily be set up in aphosphorosis. Radiographs of bones of phosphorus and calcium deficient animals are shown. It is doubted whether a magnesium deficiency in the diet of cattle could become a problem.—E. M. ROBINSON.

DU TOIT, P. J., MALAN, A. I., LOUW, J. G., HOLZAPFEL, C. R., & ROETS, G. (1934). **A Study of the Mineral Content and Feeding Value of Natural Pastures in the Union of South Africa. (Second Report).**—*Onderstepoort J. vet. Sci.* **2.** 607-648. 22 tables, 1 appendix. [7 refs.]

In this article the authors record the results of the analyses of 11 species of grasses grown in plots and cut at varying intervals from one month to a year. The samples were analyzed for crude protein, fibre, phosphorus, calcium, sodium, potassium, magnesium and chlorine. There was a noticeable decrease in the

phosphorus, protein, chlorine, sodium and potassium content of the grasses as they advanced to maturity. The very low phosphorus content after one month of growth was very noticeable. Remarkable variations were noted in the content of a particular constituent in the different species of grasses at the same stage of growth. If, however, a grass was high in any one constituent it was also high in the others.—E. M. ROBINSON.

TECHNIQUE.

KALUSCH, A. (1933). Ueber die Verwendbarkeit der Manoiloffschen Schwangerschaftsreaktion zur Diagnose der Trächtigkeit bei Pferden und Rindern. [**The Use of Manoiloff's Pregnancy Reaction for Mares and Cows**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 639-640].

The Manoiloff test consists of the mixing of blood serum (0·3 c.c.) with a 2 per cent. aqueous solution of diuretin (1 c.c.), one drop of 0·2 per cent. alcoholic Nile blue being added to the mixture. It is a colour reaction which, according to MANOILOFF, gave a yellow or red-yellow reaction in positive cases and a blue or purple reaction in negative cases. Kalusch tested the reaction with the serum of 292 mares and 221 cows, but no reliable results with regard to the presence or absence of gestation were obtained.—J. E.

PUSTELNIK, L. (1934). Die Mikroreaktion nach Feulgen und ihre Anwendung bei einigen pathologischen Veränderungen (Wut, Staupe, Geflügelpocken). [**The Feulgen Microreaction and its Use in Veterinary Pathology**].—*Inaug. Diss. Vienna.* [Abst. from abst. in *Wien. tierärztl. Mschr.* **21.** 638].

The Feulgen reaction consists of the demonstration of thymonucleinic acid as a component part of cell nuclei. The reaction can be used in histology and the author employed it in examining tissue from cases of rabies, canine distemper and fowl pox, with the object of finding out whether or not cell inclusions originate from the nucleus. Negative results were obtained, supporting the opinion that cell inclusions do not originate from nuclei.—J. E.

WITTE, J. (1934). Ueber eine modifizierte Kolleschale in Verbindung mit einem geeigneten Halter für Petrischalen. [**Modified Kolle's Culture Vessels and a Suitable Holder for Petri Dishes**].—*Zlb. Bakt. I. (Orig.).* **132.** 380-382. 3 figs.

A type of culture flask is described which resembles a pear-shaped Roux flask. Its dimensions are roughly comparable to those of a petri dish, being 13 cm. long, 9 cm. wide and 3 cm. deep. The neck is 2·5 cm. long, 2·7 cm. wide and 2·0 cm. high. Culture flasks of this shape are less liable to become contaminated than are petri dishes. Metal carriers are described for holding these flasks in piles of six.—E. J. PULLINGER.

WILLIAMS, J. W. (1934). **Scalp Products and Hair before Puberty as Culture Medium for Certain Pathogenic Fungi.**—*Proc. Soc. exp. Biol., N.Y.* **31.** 944-945. [1 ref.]

The growth of numerous pathogenic fungi on the hair and scalp products of children under 12 years, before and after extraction with ether, was compared with the growth obtained on Sabouraud's medium.

The results show that such hair makes an excellent culture medium.

—GWILYM O. DAVIES.

MISCELLANEOUS.

—. (1934). Société des Nations. Conférence sur les questions vétérinaires. **[League of Nations. Conference on Veterinary Affairs].**—*Bull. Off. internat. Epiz.* **9.** 282-288.

Representatives of 15 European nations, including Great Britain, in conference at Geneva, approved on October 21st, 1934, draft international agreements on :– (1) the organization of state veterinary services ; (2) the transport of animals and products of animal origin, and (3) the exportation and importation of meat and meat preparations. The first draft agreement is emphasized as being fundamental, namely the organization of efficient state veterinary services each under a professional head, so as to ensure efficacious action against epizootics. The second draft lays down rules for the transport of animals ; they must be accompanied by certificates of health from the exporting country, specially constructed vehicles must be used and provision made for food, water and supervision. The third draft is limited to the interchange of animal products other than food. It is intended that each agreement is to be valid for two years in the first place.

—F. BULLOCK.

BAYON, H. P. (1934). **The Study of Avian Biology in Relation to Scientific Progress.**—*J. comp. Path.* **47.** 302-319. [12 refs.]

The biology of the fowl is usually studied for its practical application but the author considers that it deserves attention on the part of the qualified investigator, not only as a stepping stone to research in comparative pathology but also for its intrinsic interest.

A rapid review of the history of biology, from the time of Hippocrates up to the present, furnishes many examples revealing that experiments and observations made on avian material have been the starting point of fruitful research, leading to remarkable advances in general and applied knowledge in the realm of biological sciences.—NORMAN DOBSON.

WATERSTON, D. (1934). **Pain and the Mechanism of its Production.**—*Brit. med. J.* Dec. 15th. 1087-1089.

It is suggested that there may be a common factor operating in the causation of pain. Recent work in sensory physiology has disproved the popular belief that pain is merely a sign of over-stimulation of sensory nerves. The author, referring to work by LEWIS, agrees that there is evidence to show that in certain types of injury a pain-producing or " p substance " can be liberated locally. In view of the similarity existing between areas of pain from local and referred causes, the author suggests a common underlying factor in each case. The fact that these areas of pain, and to some extent areas of hyperalgesia, can be relieved by local saline injections suggests that the pain-producing substance present has been removed by the saline solution.—A. L. MULLEN.

TARANTINO, G. B. (1934). L'industria zootecnica nella Somalia italiana. (Bovini). **[The Livestock Industry in Italian Somaliland. (Cattle)].**—*Critica zootec.* **11.** 368-386. 7 figs.

Italian Somaliland is inhabited by nomadic tribes whose chief occupation is cattle rearing. Large tracts of forest are found in the interior of the country and the cattle are chiefly concentrated in the less densely forested areas where a certain number of Graminaceae occur. The temperature varies between 19° and 45°C. and monsoons blow from December to March and from June to September. The

cattle population is made up of zebus which have been crossed with native stock, and four recognized varieties have been established. The largest of these is the giddu ; these would make excellent beasts of burden, although the natives do not put them to any work. The general management of the cattle, especially calves, by the natives is extremely bad, and one cow will barely produce sufficient milk to rear her calf. The government has assisted the livestock industry by setting up a serum-producing institute and by importing two European bulls. The crosses from these have made very satisfactory progress and, by improving the method of management and stimulating the export of meat and hides, the livestock industry could become of great value to the country.—J. A. NICHOLSON.

IVY, A. C. (1934). **Some Contributions by Animals to Human Health.**—*Calif. West. Med.* **41.** 247-250.

A brief account of demonstration material prepared for a popular exhibition. Legends are given of some 50 or more exhibits, illustrating the employment of laboratory animals in the preparation and standardization of biological products for use in medicine.—J. E.

OFFICIAL AND OTHER REPORTS.

SCOTLAND. (1934). **The Hannah Dairy Research Institute. Annual Report for the Year ending 31st March, 1934.** [WRIGHT, N. C.] pp. 19. 2 plates. Glasgow : Aird & Coghill, Ltd. [8vo].

Among the research staff of seven persons is one veterinary pathologist.

The work of the Institute is divided into two main groups, the first dealing with biological problems and the second with technical problems.

BIOLOGICAL RESEARCH.—Investigations into the nature of the precursors of the milk constituents (i.e. the form in which the digested food constituents are transported to the milk glands) have been continued. The results of two investigations have been published dealing with (a) the extent to which the milk supply is at present infected, and (b) the means by which bovine tuberculosis might be quickly and economically eradicated from dairy herds. The first demonstrates the present unsatisfactory nature of the raw milk supply as regards tuberculosis infection and indicates how such infection can be reduced and eliminated. The second gives an account of an experimental eradication scheme, the results of which show the feasibility of reducing the incidence of tuberculosis in dairy herds by assisting the farmer with free tuberculin testing and free advice on segregation methods.

An experimental scheme has been planned in which segregation methods for the control of bovine contagious abortion are being applied to a number of typically infected herds.

The aetiology of bovine milk fever is under investigation. As the pituitary gland plays an important role in parturition it seemed possible that, apart from the role of hypocalcaemia, milk fever might be associated with some disturbance in the function of this gland. In normal cows immediately prior to parturition there is a marked increase in the pituitrin content of the blood, which falls to a normal level immediately after calving, but in cows with milk fever the pituitrin remains at a relatively high level for a long time after calving.

TECHNICAL RESEARCH.—Reports have been published on the effect of pasteurization on the nutritive value of milk and on certain economic aspects of pasteurization, including the probable effect on clean milk production and disease eradication.

The construction of byre floors and equipment for byres are also under investigation.—S. J. EDWARDS.

COMMONWEALTH OF AUSTRALIA. (1933). **Seventh Annual Report of the Council for Scientific and Industrial Research for the Year ended 30th June, 1933.** [JULIUS, G. A., RIVETT, A. C. D., & RICHARDSON, A. E. V.] pp. 87. 2 tables. Canberra : Govt. Printer. [fcp] [3s. 8d.]

The investigations of the Council are separated into six main divisions – Plant Industry, Economic Entomology, Animal Nutrition, Animal Health, Soil Research and Forest Products – together with a section on Food Preservation and Transport, and on Viticultural and Citricultural Research Stations.

ANIMAL HEALTH.—Work is in progress to determine the method of transmission, as well as a diagnostic test, for caseous lymphadenitis of sheep. A search is also being made for the causal organism of footrot of sheep. Parasitological work on sheep includes a determination of the life history of the lungworm, *Dictyocaulus filaria*, and a study of resistance to *Haemonchus contortus*. Field trials were carried out to demonstrate the importance of adequate nutrition in preventing parasitic infestation, as well as the effect of periodic drenching on removal of parasites and the general well-being of the sheep.

In cattle it has been demonstrated that four distinct organisms are responsible for tick fever while, by the aid of an improved complement-fixation test, it is hoped that even carriers of contagious bovine pleuro-pneumonia may be detected. It has also been indicated that phosphorus deficiency is the cause of pegleg disease in cattle, and an attempt to produce a breed of cattle suitable to the tropical north has been made by the introduction of zebu cattle for crossing with the British breeds. As a preliminary to experiments on bovine mastitis, a bibliography is being prepared summarizing all previous work in other parts of the world.

ANIMAL NUTRITION.—Owing to the importance of sheep in Australia, the work of this division is concentrated mainly on the diet of the sheep and its effect on wool and mutton production.

In connection with work on sulphur metabolism, the accuracy of estimating cystine and cysteine in grasses and other plants has been increased, and a biological assay of the amount of cystine-cysteine in fodders is being carried out, together with studies on the polypartite nature of vitamin B. Descriptions are given of experiments to determine the effect on wool growth, over both long and short periods, of various minerals added to a balanced basal ration.

Phosphorus metabolism has also received attention, over 100 observations of the concentration and distribution of phosphorus in the blood of sheep on one property, throughout the year, giving a result of 18·5 mg. P per 100 c.c. blood, of which 4·5 mg. was inorganic, 4·7 mg. organic acid soluble and 9·2 mg. organic acid insoluble. Estimations have been made of the excretion of phosphorus in urine and saliva, while the results of feeding sheep on a diet deficient in P but adequate in digestible proteins and vitamins, showed that the wool growth and skeletal size were not affected when compared with a group on adequate P, but the gain in body weight was less and the bony tissue somewhat softened. The toxicity of fluorides for sheep is being investigated.

Full reports are given of the results, on two field stations, of top-dressing pastures with sulphur and rock phosphate, and with soluble phosphate and nitrogen, and the effect on the sheep grazed on them. On another field station, the effect on wool production of feeding supplements was observed, the results being beneficial in all cases. The supplements used were blood meal, yeast and casein, and linseed.

Economic Entomology.—Of chief interest to veterinarians are the investigations on the control of buffalo fly and the sheep blowfly. An attempt to control the former has been made by the liberation of parasites such as *Spalangia sundaica* and *S. orientalis*.

Nineteen species of blowfly have been recorded, the most important being *Lucilia cuprina*, and, for three years, record has been kept of the relative seasonal prevalence of the more important flies. The susceptibility of sheep to fly has been studied, together with methods of prevention. Disposal of carcasses by burial is useless, though some poisons are effective ; large-scale trapping experiments are in progress and a number of dressings for struck sheep have been tried, only two giving promise of success. A full report of progress has been published as Pamphlet No. 37 of the Council.

Cold Storage Investigations (Chilled Beef).—Investigations are in progress at the Brisbane abattoir, and it has been found that the method of air-conditioning gives a maximum of 48 days for delivery of beef in optimum condition, by controlling growth of moulds, while the second method of adding small percentages of carbon dioxide gives a maximum of 55 days. The problem now arises of rendering ships' holds " gas-tight " for carriage.—I. Clunies Ross.

Velu, H. (1934). Rapport sur le fonctionnement du laboratoire de recherches du service de l'élevage du Maroc pendant l'année 1933. **[Report of the Laboratory of the Livestock Service, Morocco, for the year 1933]**.—*Arch. Inst. Pasteur Algér.* **12.** 292-304.

Velu, H. (1934). Rapport sur le fonctionnement du laboratoire de recherches vétérinaires des T. O. M. en 1933. **[Report of the Army Veterinary Research Laboratory (Morocco) for 1933]**.—*Rev. vét. milit.* **18.** 119-126. [4 refs.] [These two reports are substantially the same].

The principal part of these reports deals with two epizootics, viz., equine infectious anaemia and dourine.

Equine Infectious Anaemia.—The principal points elicitated are :- (1) this disease is localized in certain districts in the mountainous regions of the Moroccan Atlas and the Riff ; (2) the horse is most often affected, the mule less so and only in the chronic form ; (3) the disease is seasonal and coincides with the activity of biting insects ; (4) a scientific examination of the suspected insects would prove useful ; (5) diagnosis is only possible in acute cases : in chronic or subacute cases, it is difficult to differentiate this disease from anaemia due to other causes ; (6) a systematic study of the volumetric index and destruction of the blood corpuscles assists in following the evolution of the disease : graphs made from each case serve as useful records ; (7) the Moroccan disease seems different in type from the French and the European types : in Morocco it is a disease localized in the mountains without any tendency to spread to the plains and does not appear to be contagious to other animals in the same stable : " stovarsol ", so efficacious in France, is useless, and (8) the only remedy seems to be the exclusive use of the mule instead of the horse.

Dourine and Débab.—These two affections, although less frequent than infectious anaemia, especially dourine, play an important role in North African pathology. Their diagnosis is very important as they generally exist in a discrete chronic form. Watson's complement-fixation test is considered to be inconvenient because it is necessary to prepare and titrate the antigen for each reaction ; a stable alcoholic antigen has been prepared and is considered to be more convenient. By this method, numerous cases have been diagnosed and it has been possible to follow the treatment step by step by Ciuca's method (" novarsenobenzol " in

large doses) or " naganol " [VELU, ZOTTNER, TRAIN & BERNARD. (1933). *Bull. Soc. Path. exot.* **26.** 439 and VELU. (1933). *Rev. vét. milit.* **17.** 95].

PIROPLASMOSIS.—Piroplasmosis of the horse is rare in Morocco and is most serious in imported animals. " Gonacrine " has given good results equal to those of trypan blue in the treatment of piroplasmosis and theileriasis [VELU, ZOTTNER, & IPOUSTÉGUY. this *Bull.* **4.** 24. and VELU. this *Bull.* **4.** 565].

Work has also been done on :– (1) the diffusion of sheep pox virus mixed with saponin or testicular extract in the body ; (2) chemical sympathectomy and grafting ; (3) light and disease [this *Bull.* **4.** 481], and (4) anaesthesia by the intravenous injection of sodium evipan.

DARMOUS.—The aetiology and pathology have been studied. Prophylaxis should be possible.

MILK.—The work in the laboratory has shown that there is need for great improvement in the hygiene of milk production in Morocco.

BRAN.—The use of bran in rations [presumably for horses] of unsuitable balance – excess of calcium phosphate – has been responsible for serious illness.

The numbers of specimens sent to the laboratory, and the amount of serum and vaccines sent out, are given.—T. DUNLOP YOUNG.

GREAT BRITAIN. (1935). **Report of the Medical Research Council for the Year 1933-1934.** [MELLANBY, E.]. pp. 172. London : H. M. Stat. Off. [8vo] [3s.]

The report is divided into the following seven main sections :– (1) an introduction, describing briefly the general nature of the research work covered ; (2) The Work of the National Institute for Medical Research ; (3) The Determination of Biological Standards and the Methods of Biological Assay and Measurement ; (4) The Department of Clinical Research, University College Hospital, London ; (5) External Research Schemes ; (6) Industrial Health and (7) Travelling Fellowships. The composition of the 25 Investigation Committees for Special Subjects is given in an appendix.

A grant-in-aid of £139,000 was voted by Parliament during the financial year, £9,000 being allocated to administration and travelling expenses of the Council, £54,000 for the National Institute for Medical Research at Hampstead and the farm laboratories at Mill Hill, and £76,000 for research grants to scientific work elsewhere. Important additions to this public monetary grant were received from certain other sources.

Prof. E. MELLANBY has succeeded the late Sir Walter FLETCHER as Secretary to the Council.

THE NATIONAL INSTITUTE FOR MEDICAL RESEARCH.

DISEASES CAUSED BY VIRUSES.

The Institute's research activities in infective pathology continue, as in recent years, to be concerned mainly with viruses and virus-like infective agents.

INFLUENZA.—The work with ferrets as experimental animals has been continued. It has been found that mice – previously considered to be insusceptible – can be infected.

The results obtained with the virus of swine influenza are closely similar to those obtained with the virus of human origin as regards infection of the ferret and mouse, immunity and filtration.

PROPAGATION OF VIRUSES.—The use of artificial cultures from human foetuses for the propagation of certain human disease viruses was studied, but the results

were not successful; there has been, however, increasing use of the chorio-allantoic membrane of the chick in the egg for the measles virus and for the viruses of vesicular stomatitis, " louping ill ", Newcastle disease and fowl plague.

PSITTACOSIS.—The infective units of this virus are sufficiently large to be visible to ordinary microscopic examination by special staining methods. Approximate measurements have thus been obtained, the estimated diameter being 0·2 to 0·4μ.

OTHER RESEARCH WORK.—" Louping ill ", bacteriophages, infective tumours and the photodynamic inactivation of viruses have been studied.

BACTERIAL CHEMISTRY AND IMMUNOLOGY.

The specific constituents of tuberculin and a specific precipitation test with urine of infected persons have been studied. Diagnostic johnin, produced by the growth of Johne's bacillus on a synthetic medium, has yielded successful results.

PHYSIOLOGY.

Research work has been carried out on the chemical transmission of nervous effects, carbohydrate metabolism, sex hormones and calciferol (vitamin D).

THE DETERMINATION OF BIOLOGICAL STANDARDS.

A regular distribution has been maintained of the standards held by the Institute under the Therapeutic Substances Act, or on behalf of the Health Organization of the League of Nations, or for the British Pharmacopoeia. These cover bacterial suspensions and antisera, toxins, tuberculins, vitamins and hormones.

THE NATIONAL COLLECTION OF TYPE CULTURES.

Over 5,000 cultures were distributed and 200 new cultures were deposited for maintenance.

EXTERNAL RESEARCH SCHEMES.

Hormones, the causation of goitre, nephritis, heart disease, the nature of the anti-anaemic substance (haemopoietin) in the hog's stomach, fat metabolism, anaemia, the mechanism of pain, anaesthetics, studies on body growth and on cell and tissue growth, certain neurological problems, malignant disease, certain surgical investigations, chemotherapy, genetics, statistical investigation and epidemiology are among the very wide range of subjects that were studied at outside institutions with the help of monetary grants from the Council.

In the section on nutrition active work has been carried out on vitamins.

At Aberdeen, a study was made of the sources of human undulant fever. It is concluded that, apart from direct contact with diseased cattle, the chief method of infection is by drinking raw milk.

The relationship of bovine tubercle bacilli to human pulmonary tuberculosis and to tuberculous meningitis are under study at Cambridge. It has been found in investigations of cases at Stafford and Aberdeen that there was a relatively high incidence of bovine infection in such human cases.

Trials with the BCG vaccination of calves have been continued at Cambridge, and immunity to tuberculosis has been studied at Oxford.

The nutrition of bacteria was studied at the Middlesex Hospital, London, and two new growth factors were demonstrated.

The physical chemistry of antigens and antibodies and the methods by which they combine in immunity reactions is under investigation at the Lister Institute, at the London School of Hygiene and Tropical Medicine and at the Middlesex Hospital, London.

HELMINTHOLOGY.

Immunity and the influence of diet on worm infestation has been studied at St. Albans.—W. A. P.

GREAT BRITAIN. (1934). **Eleventh Scientific Report on the Investigations of the Imperial Cancer Research Fund.** pp. ix + 177. 37 text figs., 152 figs. on 58 plates, 9 tables, 11 charts. [Numerous refs.] London : Taylor & Francis. [8vo] [30s.]

This report consists of 14 separate papers. In the first paper Dr. FOULDS shows that different strains of the filtrable fowl tumours are separate pathological entities. This was demonstrated in the rate of growth, in the proportion of successful inoculations and regressions, in the incidence of metastases and especially in the distribution of secondary tumours. The second paper, by FOULDS, deals with the variations in structure in the tumours at their site of inoculation and their metastases, attributable in part to modifications impressed on them by the tissues in which they grew, and in part to a response of the tissues to invasion of the new growth. In a third paper by the same author it was shown that, following autoplastic transplantation of the thymus of the fowl, only the epithelial cells survived and underwent hyperplasia ; explanations are then given for the variations in structure of secondary growths in this organ compared with the primary tumour. Dr. WATSON shows that there is an increased tumour response in tar-treated mice when their diet is supplemented with fresh liver. Dr. HORNING, utilizing the comparatively new histological method of microincineration of sections, describes the distribution of inorganic matter in tar tumours of rodents. The technique is described in detail. An increase of ash is found consistently in hypertrophied stroma and malignant cells. In the subsequent paper it is shown that radium treatment results in a redistribution of inorganic matter. Dr. CRABTREE and Dr. CRAMER contribute their results of continued investigations on the action of radium on cancer cells. The last two papers are by Dr. LUDFORD and deal with certain important cytological aspects of cancer research. The structure and behaviour of macrophages, polyblasts, lymphocytes, giant cells, fibroblasts and malignant cells in tissue cultures of tumours are all described. By using relatively stable colloidal solutions of Sudan III and Sudan black in serum, fatty droplets in both normal and malignant cells were stained. It is suggested that the plasma membrane of malignant cells is relatively rich in fatty substances.

In a brief review such as this it is impossible to do justice to these important papers, many of which are accompanied by numerous illustrations (microphotographs, drawings and coloured plates), which are an object lesson as to how histological material can and should be demonstrated in papers.—J. R. M. INNES.

SCHMIDT, J. (1934). Bericht über die 93. Versammlung der Gesellschaft deutscher Naturforscher und Aerzte zu Hannover, 1934. I. Allgemeiner Teil. II. Die Veterinärmedizin auf der Naturforscherversammlung. [**Report of the 93rd Meeting of the Society of German Biologists and Doctors at Hanover, 1934. I. General. II. Veterinary Section**].—*Berl. tierärztl. Wschr.* **50.** 742-745, 759-763 and 774-777. 1 table.

This four-day annual congress covers all the biological sciences, including human and veterinary medicine. Short summaries of all the papers presented are given. The veterinary papers were also published in full in other German veterinary periodicals, notably in the *Dtsch. tierärztl. Wsch.* and are being abstracted in this *Bulletin*.—J. E.

BOOK REVIEWS.

SHARPEY-SCHAFER, E. [F.R.S. Formerly Professor of Physiology, Edinburgh]. (1934). **Experimental Physiology.** pp. viii + 168. 94 figs. London, New York & Toronto : Longmans, Green & Co. [5th Edit.] [8vo] [6s.]

This well-known laboratory manual has been revised and brought up to date. It will be found most useful by those students whose knowledge of physics is rather scanty, as very detailed, but extremely clear, descriptions are given of most of the electrical apparatus necessary for the technique of experimental physiology. The experiments dealing with muscle and nerve physiology are given in greatest detail but the functions of the heart, blood vessels, respiratory apparatus, central nervous system and special sense organs are well illustrated by the experiments described. Since no experiments of a chemical nature have been included, the scope of the book is limited, but its usefulness to the student would have been increased by a chapter on the physical properties of blood.—JAMES STEWART.

MACEWEN, H. A. [M.B., Ch.B., D.P.H., F.R.S.E.]. (1934). **Food Inspection.** [Edited by B. M. MACEWEN, M.D., D.P.H.] pp. xii+524. 49 figs., 24 plates, 26 tables. [30 refs.] London and Glasgow : Blackie and Son, Ltd. [5th Edit.] [8vo] [12s. 6d.]

Macewen's " Food Inspection " has been used as a text-book by students for the examination for the Meat and Food Inspectors' Certificate since 1909. This is the fifth edition, a proof of its usefulness.

Dr. Hugh Macewen has probably given more attention to the subject of food inspection at home and abroad than most medical officers at present in office and each edition shows proof of his continued interest in the work.

Dr. Macewen Jr. is to be congratulated on his revision of previous editions. The book has been enlarged and contains much information that is necessary to sanitary food inspectors. As stated in the preface, it is intended that the book should be used by those preparing for the food inspectors' certificate and it will also prove useful to medical men taking their D.P.H.

The book does not aim at being a work of reference, but it has an even more useful object because works of reference generally require a scientifically trained person to understand the technically stated contents. Some of the articles may be considered too brief, but this is unavoidable in a work for everyday use published at a reasonable price.

The contents deal with elementary anatomy and physiology, diseases of animals, *post-mortem* appearances and judgment, the latter being those detailed in Memo 62 Foods (Ministry of Health, Great Britain). Brief notes are given on the inspection of live animals, slaughter and abattoirs, fish, poultry, eggs, cereals, beverages, condiments, milk and milk products and other foods, and on preservation and storage of meat. Finally, there is a useful summary of the acts, regulations and orders relating to the inspection of foods.

The plates are good, the print and general production of the book is a great credit to the publishers and the work can be recommended to food inspectors and students.—T. DUNLOP YOUNG.

HEIDERMANNS, C. [Privatdozent der Zool. u. vergleichenden Tierphysiol. Univ. Bonn]. (1933). Grundzüge der Tierphysiologie. Ein Leitfaden für Studierende. [**Fundamentals of Animal Physiology**]. pp. xii+246. 31 figs., 9 tables. [31 refs.] Jena : Fischer. [8vo] [RM.14].

This is a new book of the compendium class dealing with comparative

physiology in a very wide sense, including both invertebrates and vertebrates. Its chief value is for junior veterinary, medical and biological students, as it gives a concise account of the physiological processes in the various zoological classes.

Slightly over one half of the book deals with the biochemical processes of digestion and metabolism in general, and the remaining pages deal with the functioning of the different body systems.

It ought to be a welcome text-book to the busy student, as it gives the necessary information without verbosity.—J. E.

HARRIS, D. T. [M.D., D.Sc., F. Inst. P., Professor of Physiology, London Hospital Med. Coll.] (1934). **Experimental Physiology for Medical Students.** [Revised and enlarged edition of ANREP and HARRIS' "Practical Physiology"]. pp. ix + 248. 230 figs., 1 plate, 10 tables. London : J. & A. Churchill, Ltd. [8vo] [12s. 6d.]

This admirable text-book describes the practical course given to junior and senior students at University College, London, and its revision and enlargement has increased its usefulness to all interested in physiology. The whole field of experimental physiology is touched upon, and the criterion of such a book must rest upon the selection of experiments offered ; readers will find that, in this case, the author has usually made a very wise one. The chapter on practical pharmacology is perhaps the weakest, but it is adequate for its purpose in giving an introduction to the subject.

Though written with a medical bias the veterinary student will find this text-book most helpful, not only in the laboratory but also in his attempts to correlate his theoretical knowledge of physiology with its practical aspects.—JAMES STEWART.

MCDOWALL, R. J. S. [D.Sc., M.B., F.R.C.P. (Edin.), Professor of Physiology at King's College, University of London]. (1934). **The Science of Signs and Symptoms in Relation to Modern Diagnosis and Treatment. A Textbook for General Practitioners of Medicine.** pp. xv + 542. 11 figs., 4 tables. [7 pp. refs.] London : William Heinemann Ltd. [3rd Edit.] [8vo] [21s.]

A first impression on reading this book is surprise that it had not been written long ago. The fact that it has already run to three editions in the short space of two years is convincing proof of a gap that existed in medical literature and the success with which Professor McDowall has filled it. This book is described as a text-book for general practitioners of medicine. The title, however, suggests that it should contain something of interest to the veterinary practitioner as well, particularly when we remember how much more dependent he is on objective symptoms than is his medical confrère.

The book is divided into 48 chapters, the majority of which have a direct bearing on veterinary medicine. This is particularly true of those devoted to the pulse and heart sounds, cardiac efficiency, the physiological principles of feeding, vitamins, body temperature, the autonomic nervous system and protection against disease. Other chapters such as those devoted to speech, hearing, taste and headache are of less value in this connection.

The work, throughout its pages, keeps strictly within the scope indicated by the title, and human pathology and medicine do not obtrude unduly upon the field. The interpretations and explanations offered are of the greatest interest and value. There are many references to information derived from work on experimental and other animals. The physiological action and therapeutic use of certain drugs are considered in some detail. A valuable aspect of the book is the manner in which advances in physiological knowledge are brought to notice and

correlated to clinical work.

The book may be heartily recommended to the practising veterinarian as a healthy stimulus to thought, and a valuable contribution to knowledge in regard to an aspect of clinical medicine of particular importance to him.—C. DAVENPORT.

IRVINE, K. N. [D.M., M.A., B.Ch., M.R.C.S., L.R.C.P.] (1934). **The B.C.G. Vaccine.** pp. 70. 2 tables. [Numerous refs.] London : Oxford University Press. [8vo] [5s.]

This book is the result of two years spent by the author in visiting clinics and laboratories in Europe and America where BCG vaccine is being either employed or studied. He has not himself carried out any research work on the subject and considers, therefore, that he has been able to review this controversial subject more impartially than might be expected from one actively engaged in its investigation. Further, sufficient time has now elapsed since the introduction of the vaccine to allow of a dispassionate assessment of its value, as both the over-enthusiasm of its protagonists and the criticism of the opposition have quietened.

Irvine reviews the literature on the dissociation of BCG and the claim that virulent S colonies can be obtained. He points out that, although more negative than positive results have been reported in this work, it is not sufficient to dismiss the positive results as being merely experimental errors. He himself has, however, observed two possible sources of error, first, that there are some investigators who are content to diagnose tuberculosis in laboratory animals from the macroscopic appearances of the lesions and, secondly, that as the result of overcrowding and bad hygienic conditions, spontaneous tuberculosis in guinea pigs is not infrequent in some laboratories. He considers that in face of the evidence it is not possible to regard BCG as a " virus fixe ", but in an earlier chapter he suggests that the originators of the vaccine should state that it is a " virus fixe " when cultured according to their instructions.

The bulk of the evidence obtained from animal inoculations with BCG points to the production of retrogressive and harmless lesions.

The author refers briefly to the Lübeck disaster and considers that the circumstantial evidence exonerates BCG from all blame.

He mentions that 1,343,000 children have been vaccinated and that there is no evidence that it has caused any deaths and says " we would indeed be cautious if we still doubted the safety of the vaccine for the normal infant."

Irvine states that the majority of investigators report favourably on the protective value of BCG vaccine for cattle. It has not yet been applied on a large scale because it invalidates for a considerable period the diagnostic value of tuberculin, and because its excretion in the milk of vaccinated animals demands that its innocuity for man should first be established beyond any doubt.

Nearly all investigators have obtained encouraging results from the use of the vaccine on children. It is generally agreed that the protection conferred is not absolute and that the large accumulation of statistics do not, for various reasons, permit of an accurate assessment of the degree of immunity conferred by it.

Irvine concludes with the important statement that the existing conservative attitude towards the use of BCG in England is no longer warranted on the available evidence, and considers that it might be usefully employed as an ancillary weapon in the existing system of control.

While it is unlikely that the author's conclusions will meet with general acceptance, he has undoubtedly achieved his object in encompassing, within this small volume, a clear and impartial survey of this difficult and important problem.

—T. M. DOYLE.